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# Trends in Attrition of High-Quality Military Recruits

Richard Buddin

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ISBN: 0-8330-0906-0

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Published by The RAND Corporation  
1700 Main Street, P.O. Box 2138, Santa Monica, CA 90406-2138

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R-3539-FMP

# **Trends in Attrition of High-Quality Military Recruits**

Richard Buddin

August 1988

Prepared for the  
Office of the Assistant Secretary of Defense/  
Force Management and Personnel



**RAND**

90 03 20 004

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER R-3539-FMP	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Trends in Attrition of High-Quality Military Recruits		5. TYPE OF REPORT & PERIOD COVERED interim
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) R. Buddin		8. CONTRACT OR GRANT NUMBER(s) MDA 903-85-C-0030
9. PERFORMING ORGANIZATION NAME AND ADDRESS The RAND Corporation 1700 Main Street Santa Monica, CA 90406		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Ofc, Asst Secty of Defense for Force Mgmt & Personnel, Washington, D. C. 20301-4000		12. REPORT DATE August 1988
		13. NUMBER OF PAGES 101
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)  Approved for Public Release; Distribution Unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)  No Restrictions		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Recruits Attrition		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  see reverse side		

This report documents attrition patterns in the U.S. military services from FY 1982 through FY 1985 and also examines attrition across training bases. The purpose of the study was to gain insight into why the recent improvements in the quality of recruits has not reduced attrition rates. Attrition patterns in recent cohorts suggest that attrition rates do not depend simply on the characteristics of individual recruits but also on other factors. These attrition patterns indicate that institutional or "demand-side" factors may play an important role in determining attrition rates. The findings indicate that the magnitude of cohort and training base effects differs by service. Service practices and policies may vary considerably at different bases and in different years. Thus, while recruit characteristics can be used to rank prospective recruits by risk category, different interpretation and enforcement of service policies seem to critically affect the actual attrition level. 101 pp.

## PREFACE

Previous attrition research has concentrated on how recruit characteristics affect attrition rates. Higher quality recruits, particularly those with high school diplomas, have consistently had much lower attrition rates than low-quality recruits. In recent years, the active enlisted forces have sharply increased the proportion of high-quality enlistments, but the improved recruit quality has not led to the anticipated reduction in recruit attrition. The research reported here examines the hypothesis that factors other than recruit characteristics may have an important, and still unexamined, bearing on attrition rates. By misunderstanding or neglecting the role of these factors, manpower planners have been unable to accurately predict how changes in recruit quality will affect attrition rates.

The research was sponsored by the Directorate for Accession Policy, Office of the Assistant Secretary of Defense for Force Management and Personnel, within RAND's National Defense Research Institute, an OSD-sponsored federally funded research and development center. It was conducted by the Attrition Policy project, part of RAND's Defense Manpower Research Center.

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## **SUMMARY**

### **BACKGROUND**

Since 1980, the active enlisted forces have dramatically increased the proportion of enlistments having high school diplomas and scoring above the 50th percentile on the Armed Forces Qualification Test (AFQT). Historically, the attrition rates of these high-quality recruits has been half that of low-quality recruits, so manpower planners anticipated that the extra recruiting costs of attracting more high-quality recruits would be partially offset by cost savings from lower attrition rates.

### **THE QUALITY/ATTRITION DILEMMA**

Recent experience indicates, however, that trends in cohort attrition are not well predicted from trends in cohort quality. Low-quality recruits have much higher attrition rates than high-quality recruits in each cohort, but sharp improvements in cohort quality in the early 1980s were in fact associated with a rise in 6-month attrition losses and only a modest reduction in 36-month losses for both men and women. Between FY80 and FY83, the percentage of high-quality accessions rose from 28 percent to 49 percent for men and from 33 percent to 66 percent for women, but the 6-month attrition rate also rose 0.9 and 1.5 percentage points for men and women. The rise in recruit quality did not result in the anticipated reduction in 6-month attrition.

Rising recruit quality has, in general, reduced 36-month attrition, but very different quality cohorts have had very similar attrition levels. Between FY78 and FY82, for example, the percentage of high-quality male accessions rose from 31 to 43 percent, and the three-year male attrition rate increased slightly from 27.4 to 27.6 percent.

These attrition patterns do not mean that the services should abandon their quest for high-quality recruits. High-quality recruits continue to have attrition rates substantially below those of low-quality recruits. High-quality recruits may also improve military performance and readiness in ways beyond the scope of this research. Recent attrition trends do suggest, however, that individual cohorts have unique characteristics over and above their quality composition that have an important bearing on cohort attrition levels.

## PURPOSE

This report documents attrition patterns in the U.S. military services from FY82 through FY85 and also examines attrition across training bases. The purpose of the study was to gain insight into why attrition rates have not responded as expected to recent improvements in the quality of recruits.

Attrition patterns in recent cohorts suggest that attrition rates do not depend simply on the characteristics of individual recruits but also on other factors. These attrition patterns indicate that institutional or "demand-side" factors may play an important role in determining attrition rates.

## APPROACH

The research departs from the approach of most previous attrition research by examining the patterns of attrition across several cohorts, instead of looking at individual recruit characteristics. It compares attrition patterns across training bases as well as attrition trends at individual bases to see if there may be differences, between bases and over time, in interpreting and implementing service policies. This approach was adopted because current databases provide little direct insight into specific attrition policies or their implementation. The scope of the study did not permit analysis of service policies and practices at different training bases. If attrition rates are primarily determined by recruit quality, then comparable quality recruits should not have different attrition rates at different bases or in different accession cohorts. Consequently, an examination of attrition patterns across cohorts and bases provides indirect evidence that differences in service policies and practices affect attrition levels.

The database used in the analysis consists of all high-quality non-prior-service accessions between FY82 and FY85. Two traits define the high-quality recruit: a high school diploma and a score in the top half of the ability range on the AFQT. High-quality recruits were selected because they are considered relatively homogenous by the services, and strong trends in attrition among them suggest that factors other than recruit characteristics are affecting attrition levels. One reason that overall attrition rates have not reacted as expected to changes in recruit quality has been unexpected changes in attrition rates among high-quality recruits themselves. Department of Defense personnel files contain information on age at accession, race, education level, AFQT score, service, and time spent in a Delayed Entry Program (DEP). These recruit characteristics were used to control attrition



rates for differences in recruit quality. Information on entry cohort, training base, occupational assignment, and length of training program were used to discern other possible factors that could account for the rise of attrition rates when recruit quality improved. Attrition trends were examined during basic training, technical training, and post-training phases of enlistment. Separate analyses were conducted in each service, gender, and training phase by means of logistic regression.

## FINDINGS

The patterns of high-quality attrition rates in recent cohorts demonstrate that cohort characteristics alone do not determine attrition rates. Recruits of comparable quality have much different training attrition rates in some cohorts and at some bases in a given cohort.

The magnitude of cohort and training base effects differs by service:

- *Army.* The 6-month attrition rate for high-quality men rose from 6.6 percent in FY79 to 10.9 percent in FY83. New Army policies introduced in FY85 have reduced the 6-month attrition rate to 7.2 percent. Within a cohort, basic training attrition rates for high-quality men and women have ranged 9 and 16 percentage points higher, respectively, at some bases than at others.
- *Navy.* After controlling for differences in recruit characteristics, the basic training attrition rate of high-quality men rose about 1.5 percentage points between FY82 and FY85 from an initial rate of about 6 percent. Basic training attrition rates of comparable high-quality men differ from 2 to 3 percentage points depending on training base assignment.
- *Air Force.* Basic training attrition rates for comparable high-quality men and women have risen about 2 percentage points in recent cohorts on a base rate of about 5 percent. All Air Force recruits train at the same location, so comparison across sites is not possible.
- *Marine Corps.* Six-month attrition rates of high-quality men were stable between FY82 and FY85, but the FY82 through FY85 average was 12.3 percent as compared with 9.4 percent in the FY80 cohort. Basic training attrition rates for comparable quality men differ 4 or 5 percentage points between training bases as compared with a mean basic training attrition rate of 10 percent.

These large cohort and base effects indicate that service practices and policies may vary considerably at different bases and in different years. Thus, while recruit characteristics can be used to rank prospective recruits by relative risk category, different interpretation and enforcement of service policies seem to critically affect the actual attrition level.

## CONCLUSIONS

Further research is needed to determine whether specific policies and practices result in large attrition rate differences across bases and cohorts and how those policies and practices affect attrition. Although the effect of recruit characteristics is not to be dismissed, changes in attrition management can yield significant benefits with no adjustment in recruit quality or standards. In the Army, for example, the new Army training attrition program has resulted in 4 and 6 percent more trained high-quality men and women available in FY85 as compared with FY83. These effects are comparable in magnitude with those of enlistment incentives such as enlistment bonuses and educational benefits. A broader understanding of "demand-side" factors would enable the services to improve attrition management and accurately anticipate how changes in recruit quality would affect attrition rates.

## ACKNOWLEDGMENTS

The author is grateful to Dr. Steven Sellman, Director for Accession Policy in the Office of the Assistant Secretary of Defense for Force Management and Personnel, for his support and encouragement of this research. Dr. Zahava Doering from the Defense Manpower Data Center and Lieutenant Colonel Frank Terrell from the Directorate for Accession Policy provided useful comments and direction as project officers for the study. The author also benefited from discussions of preliminary results with Major Denny Eakle-Cardinal, Lieutenant Colonel William Carr, Lieutenant Colonel David McKenzie, and Mr. Robert Nemetz of the Office of the Assistant Secretary of Defense for Force Management and Personnel and with Drs. Michael Laurence and Bette Mahoney of the Defense Manpower Data Center. Mr. Les Willis of the Defense Manpower Data Center created the data file for the study. Among RAND colleagues, Rick Eden, Glenn Gotz, James Hosek, Judith Lewis, and Alvin Ludwig provided useful comments on an earlier draft. Stephen Carroll and John Winkler provided thoughtful technical reviews.

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## I. INTRODUCTION

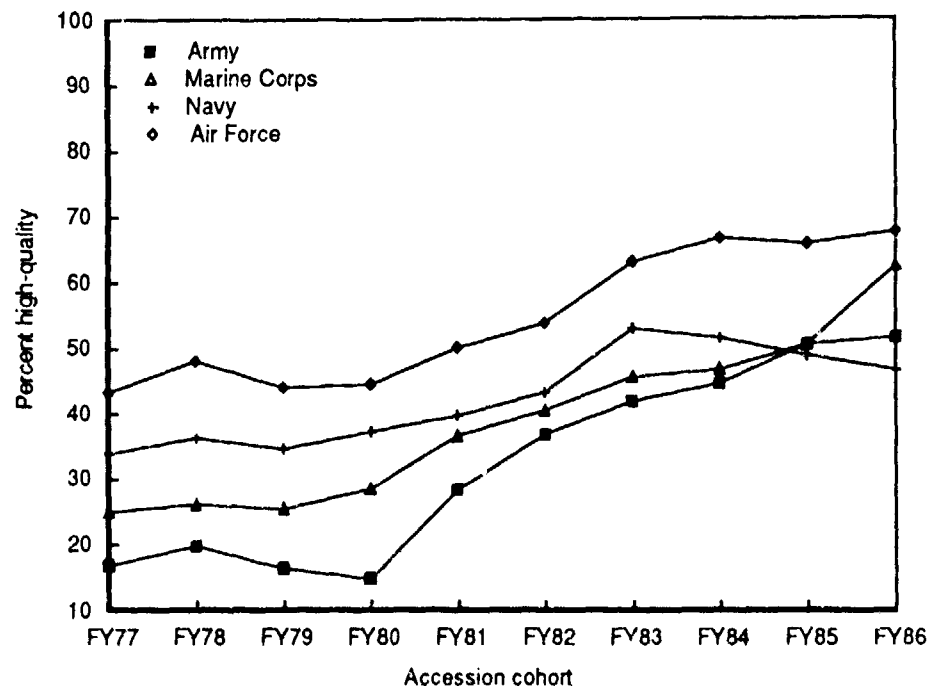
### BACKGROUND

In recent years, the active enlisted forces have succeeded in dramatically increasing the proportion of enlistees who have high school diplomas and who score above the 50th percentile on the Armed Forces Qualification Test (AFQT). As a result, the quality of recruits has improved in all services for both men and women. Figure 1 shows that the largest gains have been achieved in the Army and Marine Corps, where the percentage of high-quality enlistments has traditionally been lowest. Though the Air Force and Navy have usually had less difficulty attracting high-quality recruits, they have also had appreciable increases in the percent of high-quality enlistments for both men and women.

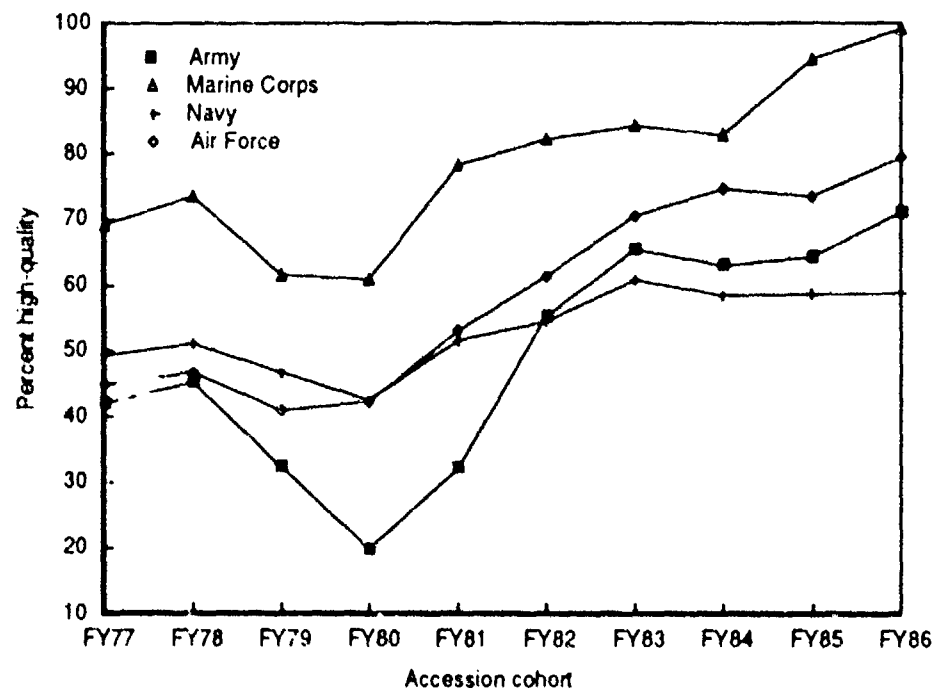
The services have strived for more high-quality recruits in part because high-quality recruits are much more likely to complete their enlistment term than are low-quality recruits. Indeed, the increase in recruit quality was expected to reduce attrition losses. Consequently, more recruiting resources were expended on high-quality enlistments because it was thought a higher quality force would save money through reduced attrition. This premise was based on consistent research findings that high-quality recruits within an accession cohort had attrition rates about half those of low-quality recruits (Defense, 1985; Fernandez, 1985; Baldwin and Daula, 1984; Buddin, 1984; Armor et al., 1982; and Sinaiko, 1981). These studies typically focused on comparisons of high- and low-quality losses within a cohort.

### THE QUALITY/ATTRITION DILEMMA

Recent experience indicates, however, that trends in cohort attrition are not well predicted from trends in cohort quality. Table 1 shows that a sharp improvement in recruit quality in the early 1980s was in fact associated with a rise in 6-month attrition losses and only a modest reduction in 36-month losses for both men and women. Between FY80 and FY83, the percentage of high-quality accessions rose from 28 percent to 49 percent for men and from 33 percent to 66 percent for women, but the 6-month attrition rate also rose 0.9 and 1.5 percentage points for men and women. The rise in recruit quality did not result in the anticipated reduction in 6-month attrition.



(a) Males



(b) Females

Fig. 1—High-quality male and female accession trends, FY78-FY85

Table 1  
TRENDS IN DOD ACCESSION QUALITY  
AND COHORT ATTRITION, FY77-FY86

Accession Cohort	% High School Diploma Graduate	% High-Quality	% 6-Month Attrition	% 36-Month Attrition
<i>All Male Accessions</i>				
FY77	69.0	27.0	13.9	30.7
FY78	73.2	30.7	11.5	27.4
FY79	69.0	27.7	10.9	28.9
FY80	65.1	27.6	10.7	31.1
FY81	79.5	37.6	10.6	28.7
FY82	84.7	42.7	11.7	27.6
FY83	89.9	49.1	11.6	25.1
FY84	92.0	50.7	10.9	23.9
FY85	90.9	53.2	9.9	na
FY86	90.3	54.4	11.0	na
Average	79.8	39.5	11.4	28.1
<i>All Female Accessions</i>				
FY77	90.6	45.2	12.8	37.2
FY78	90.3	48.1	12.9	36.3
FY79	90.6	39.5	13.2	35.1
FY80	86.6	32.8	14.3	37.5
FY81	92.7	44.6	14.9	36.1
FY82	97.2	58.2	15.4	34.7
FY83	99.6	66.5	15.8	33.8
FY84	99.5	65.7	15.7	33.3
FY85	98.1	66.8	13.5	na
FY86	97.9	71.8	14.2	na
Average	94.1	53.3	14.3	35.6

Rising recruit quality has, in general, reduced 36-month attrition, but very different quality cohorts have had very similar attrition levels. The 36-month attrition rate did fall between FY80 and FY83, but the rate for FY80 is anomalous relative to the rates for FY78 and FY79. Between FY78 and FY82, the percentage of high-quality male accessions rose from 31 to 43 percent, and the three-year male attrition rate increased slightly from 27.4 to 27.6 percent. Individual cohorts have some unique characteristics over and above their quality composition that have an important bearing on cohort attrition levels.

Tables 2 and 3 show how the 6- and 36-month attrition rates differ by cohort after adjusting for differences in the quality composition of each cohort.<sup>1</sup> The results for all DoD accessions in Table 2 confirms our impressions from Table 1 that the early attrition rates of comparable quality recruits vary considerably from cohort to cohort. For men,

Table 2

COHORT DIFFERENCES IN QUALITY-ADJUSTED 6-MONTH ATTRITION  
(Percentage point differences from mean FY77-FY86 rate)

Cohort	DoD	Army	Navy	Air Force	Marine Corps
<i>All Male Accessions</i>					
Mean Percent	11.38	12.02	10.56	9.49	14.01
FY77	2.10	4.08	3.69	.40	-2.00
FY78	-.88	-.84	.06	-.43	-2.92
FY79	-1.77	-2.70	.18	-1.31	-3.24
FY80	-2.22	-2.72	-1.42	-2.04	-2.20
FY81	-.79	-.74	-2.08	-.24	.74
FY82	.88	1.76	-.97	.61	2.88
FY83	1.39	3.45	-.91	-.35	1.96
FY84	.89	1.69	-.67	.98	1.47
FY85	-.11	-1.52	.65	1.11	1.18
FY86	1.25	-.63	2.58	1.87	3.92
<i>All Female Accessions</i>					
Mean Percent	14.31	17.03	10.82	12.35	16.64
FY77	-2.10	-3.61	-.53	-.75	1.50
FY78	-1.92	-3.69	1.62	-1.59	-2.65
FY79	-1.45	-2.81	-.24	-.81	.83
FY80	-1.44	-.83	-2.28	-1.32	-.95
FY81	.04	2.61	-2.59	-.35	-3.77
FY82	1.48	3.40	-.01	.27	.36
FY83	2.33	5.21	.93	-1.39	.14
FY84	2.31	3.97	-.32	1.70	2.38
FY85	.30	-.57	1.18	1.76	.50
FY86	1.23	-1.40	3.41	3.26	2.64

<sup>1</sup>Tables 2 and 3 are based on logistic regressions reported in App. A. The individual-level regressions show the effect of entry cohort on male and female attrition by service and for all DoD accessions while holding constant the effects of educational attainment, AFQT test score, and race.

the quality-adjusted 6-month attrition rate was 2.2 percentage points below average in FY80 and about 1.3 percentage points above average in FY83 and FY86, on a base rate of 11.4 percent. The service-specific results show that year-to-year variation is much larger than for the Department of Defense as a whole. In the Army, comparable quality male recruits would have had 6-month attrition rates 2.7 percentage points below average in FY80, 3.4 percentage points above average in FY83, and 1.5 percentage points below the 10-year average under the new Army training attrition program in FY85. Marine Corps rates are consistently much higher from FY81 through FY86 than in the earlier cohorts; 6-month male attrition rates of comparable quality recruits are over 7 percentage points higher in FY86 than in FY79. The quality-adjusted 6-month rates vary less in the Navy and Air Force than in the other services, but their loss rates for comparable quality recruits differ by about 4 percentage points between high and low attrition cohorts.

The results for women in Table 2 are qualitatively quite similar to those for men. The probability of 6-month attrition for comparable quality women differs substantially from cohort to cohort in each service. In general, when a service's 6-month male attrition rate is above (below) average in a cohort, the service's 6-month female attrition rate is also above (below) average.

As we expected from Table 1, the cohort differences in quality-adjusted 36-month attrition are not as large (relative to the average rate) as those for 6-month attrition. Nonetheless, Table 3 shows that comparable quality recruits are likely to have quite different attrition rates in different cohorts. After adjusting for quality composition, Army men had three-year attrition rates about 6 percentage points higher in FY82 than in FY79. The range of quality-adjusted three-year male attrition rates is about 3, 5, and 7 percentage points for the Navy, Air Force, and Marine Corps, respectively. Three-year attrition, like 6-month attrition, is not solely a function of the quality composition of the accession cohort as measured in terms of educational attainment and AFQT test score.

For women, cohort effects are of modest size for the Department of Defense, the Army, and the Navy after controlling for cohort quality. In the Air Force, quality-adjusted 36-month attrition was 6 percentage points lower in FY83 than in FY78. Comparable quality Marine Corps women are predicted to have three-year loss rates up to 8 percentage points different depending on entry cohort.

The results in Tables 2 and 3 reiterate our observation from raw patterns in Table 1 that changes in cohort attrition are not well predicted by changes in measured cohort quality. Some cohorts do much better or worse than we would have anticipated from their

Table 3

COHORT DIFFERENCES IN QUALITY-ADJUSTED 36-MONTH ATTRITION  
(Percentage point differences from mean FY77-FY84 rate)

Cohort	DoD	Army	Navy	Air Force	Marine Corps
<i>All Male Accessions</i>					
Mean Percent	28.13	31.12	25.49	24.37	29.80
FY77	.51	.84	1.20	1.56	-1.40
FY78	-1.82	-3.14	-1.94	2.10	-3.82
FY79	-1.47	-3.35	-.16	.80	-2.42
FY80	-.33	-1.18	.61	-.28	-.23
FY81	1.21	.91	1.26	.83	3.25
FY82	1.56	2.56	.73	-.17	3.67
FY83	.30	2.03	-1.01	-3.27	1.69
FY84	-.36	.83	-1.67	-2.77	.87
<i>All Female Accessions</i>					
Mean Percent	35.65	41.74	27.07	30.60	43.96
FY77	.71	-1.32	.98	3.98	2.78
FY78	-.16	-.89	-.19	-.05	4.25
FY79	-.30	-.61	-.33	.09	1.79
FY80	.43	1.65	-1.07	.35	-.41
FY81	.41	1.96	-1.15	.20	-2.58
FY82	.05	.09	1.37	-.98	-1.06
FY83	-.36	.01	.98	-2.14	-3.64
FY84	-.76	-.85	-.52	-1.25	-1.01

quality composition. These attrition patterns do not mean that the services should abandon their quest for high-quality recruits. High-quality recruits continue to have attrition rates substantially below those of low-quality recruits. High-quality recruits may also improve military performance and readiness in ways beyond the scope of this research. These cohort specific effects do suggest, however, that factors other than recruit quality may play a critical role in determining the level of attrition. At this point we cannot say precisely what those other factors are or how large a part they play, but indications are that they include service policies and practices.

The possibility that these factors are institutional policies or procedures is suggested by the reduction in 6-month DoD attrition



between 1983 and 1985 that primarily reflects a sharp reduction in Army training losses (see Tables 1 and 2) after the Army instituted an attrition program in December 1984 (FY85). The Army program followed an Army study in FY84 on why training losses were rising sharply in FY82 and FY83 at precisely the time of the Army's sharp rise in recruit quality.<sup>2</sup>

The patterns for women are similar, although the absolute levels of female attrition are higher than those of male attrition. The success in recruiting more high-quality women has not meant a substantial reduction in the overall attrition rate. In fact, the 6-month attrition rate of women has been drifting upward for most services.

Why have service attrition rates changed unexpectedly with these changes in recruit quality? One reason is that attrition among high-quality recruits has varied considerably from cohort to cohort. As Table 4 indicates, 6-month attrition rates for high-quality DoD accessions rose 2.5 and 4.1 percentage points for men and women, respectively, between FY80 and FY83. The share of high-quality Army accessions rose rapidly between FY80 and FY83, but 6-month attrition losses among high-quality Army recruits rose 4.0 and 6.5 percentage points for men and women. The upward trend in the 6-month attrition of high-quality male and female recruits in the Air Force and Navy continued through FY86. These attrition patterns, along with the recent policy-induced reduction in Army attrition, highlight the importance of understanding what other factors affect attrition and how.

As expected from previous results, 36-month attrition rates of high-quality personnel do not vary as much from cohort to cohort as 6-month rates. Nonetheless, Table 5 shows that for both men and women, the 36-month attrition rate of high-quality accessions changes several percentage points across cohorts. Differences in cohort attrition rates for comparable quality recruits indicate that factors other than measured recruit quality (AFQT and education level) have important effects on attrition levels.

## APPROACH

As we have noted, previous attrition studies have focused almost exclusively on the contribution that recruit characteristics have on

<sup>2</sup>The Army program and study are discussed more fully in Sec. III. The Army study was undertaken because of concern with the trend in training attrition. It is unclear whether the subsequent reduction in training attrition was a direct consequence of the study recommendations, an indirect consequence of Army concern with the attrition "problem," or a combination of both.

Table 4  
TRENDS IN 6-MONTH ATTRITION OF HIGH-QUALITY ACCESSIONS  
(Percent)

Cohort	DoD	Army	Navy	Air Force	Marine Corps
<i>Males</i>					
FY77	8.34	9.16	7.68	8.40	8.22
FY78	7.57	7.89	7.02	7.55	8.45
FY79	6.89	6.63	7.02	6.32	8.53
FY80	6.58	6.91	5.88	5.89	9.37
FY81	7.70	8.55	5.77	7.16	11.70
FY82	8.90	10.38	6.38	7.73	12.92
FY83	9.03	10.91	6.85	6.91	12.34
FY84	8.68	9.29	6.84	8.01	12.08
FY85	8.05	7.18	7.73	8.03	11.73
FY86	9.15	8.04	8.66	8.42	14.50
Average	8.24	8.70	7.04	7.51	11.47
<i>Females</i>					
FY77	11.56	12.47	8.73	9.97	19.48
FY78	11.15	12.17	10.32	9.66	13.00
FY79	11.18	13.00	8.53	9.96	16.71
FY80	11.01	14.29	7.72	9.98	15.73
FY81	12.20	18.12	7.38	10.34	12.27
FY82	14.56	19.11	9.55	10.87	16.31
FY83	15.13	20.76	9.75	9.06	16.53
FY84	15.17	19.68	8.38	12.06	17.74
FY85	13.11	15.42	9.91	11.93	16.54
FY86	13.82	14.52	11.24	13.57	18.52
Average	13.14	16.39	9.21	10.98	16.22

attrition within a cohort.<sup>3</sup> This study departs from that approach by examining patterns across several cohorts. An analysis of cohort attrition trends can help determine why attrition rates have not reacted as

<sup>3</sup>A few studies have examined demand-side factors affecting attrition. Goodstadt and Romanczuk (1980) examined how unit-level personnel management practices affected Army attrition. Majchrzak (1983a,b) studied the possibility of reducing Marine Corps attrition rates by improved management practices. Those studies do not provide any insights into recent trends in high-quality enlisted attrition.

expected to improvements in recruit quality. After controlling for recruit quality, we examine both

- Attrition patterns across training bases
- Attrition trends at individual bases

If attrition rates are primarily determined by recruit quality, then comparable quality recruits should not have different attrition rates at different bases or in different accession cohorts. Consequently, an examination of attrition patterns across cohorts and bases provides indirect evidence that differences in institutional policies and practices affect attrition levels. The scope of this study did not permit examination of specific service policies and the practices and interpretations of policy at various bases.

Table 5

TRENDS IN 36-MONTH ATTRITION OF HIGH-QUALITY ACCESSIONS  
(Percent)

Cohort	DoD	Army	Navy	Air Force	Marine Corps
<i>Males</i>					
FY77	20.91	21.90	19.30	22.40	19.73
FY78	19.71	20.12	17.52	21.74	19.35
FY79	19.66	19.22	18.34	20.89	20.75
FY80	20.23	21.34	18.98	20.07	21.75
FY81	21.31	22.76	19.16	20.74	24.71
FY82	21.13	23.19	18.53	19.72	24.29
FY83	20.01	22.64	17.55	16.94	23.56
FY84	19.49	21.47	17.28	17.09	22.98
<b>Average</b>	20.31	21.86	18.32	19.79	22.47
<i>Females</i>					
FY77	35.76	40.19	26.74	30.88	50.66
FY78	34.29	40.22	24.85	27.78	45.84
FY79	32.35	39.91	24.23	27.94	43.71
FY80	32.80	42.85	24.63	28.97	43.79
FY81	32.77	42.55	23.42	28.54	40.55
FY82	33.99	41.29	24.83	27.28	41.94
FY83	33.60	40.62	25.39	26.03	39.86
FY84	32.85	39.63	23.20	26.32	41.85
<b>Average</b>	33.49	40.72	24.49	27.85	43.08

The analysis focuses on high-quality recruits, defined as those who are high school graduates and score in the top half of the ability range on the AFQT. We examine high-quality recruits because the services consider high-quality recruits fairly homogeneous, and thus strong patterns or trends in the attrition among high-quality recruits suggest that other factors, such as service policies and practices, may be affecting the level of attrition.<sup>4</sup> Nevertheless, all high-quality recruits are not alike, and some differences over time may simply reflect changes in the composition of the high-quality group. Consequently, we use a multivariate statistical methodology to control for measured changes in the composition of the high-quality group over time.

Department of Defense personnel files contain information on age at accession, race, education level, AFQT score, service, and time spent in a Delayed Entry Program (DEP). These recruit characteristics were used to control attrition rates for differences in recruit quality. Information on entry cohort, training base, occupational assignment, and length of training program were used to discern other possible factors that could account for the rise of attrition rates when recruit quality improved. Attrition trends were examined during the basic training, technical training, and post-training phases of enlistment. Separate analyses were conducted in each service, gender, and training phase by means of logistic regression.

## CONCLUSIONS

Current databases provide little direct insight into attrition policies or their implementation, nor do they allow us to make specific judgments on specific practices or policies. But our results show that attrition rates differ substantially for similar types of recruits both across accession cohorts and across training bases in a given cohort. In other words, similar types of individuals have very different probabilities of completing training at different places and at the same base in different cohorts. These differences suggest that factors such as institutional policies and

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<sup>4</sup>Attrition rates for low-quality recruits remain substantially higher than for high-quality recruits, because low- and high-quality attrition rates have followed the same basic trends. High-quality recruits have been highly sought after by the services, so any upward trend in high-quality attrition is of particular concern. If the overall attrition trend reflected a stable high-quality attrition profile and rising low-quality attrition trend, then increased emphasis on attracting high-quality recruits might be expected to reduce the overall rate. The recent overall trends, however, reflect similar low- and high-quality attrition trends, so it is important to analyze why the attrition rates of comparable quality recruits are changing over time. We chose to examine the high-quality group instead of the low-quality group because recent accession policies have aimed at attracting more high-quality recruits.

practices may have a critical effect on attrition levels. This finding intimates that a broader understanding of service policies is needed before we can reasonably anticipate how future changes in recruit quality might affect attrition levels. Additional attrition research should examine specific attrition policies, as well as their implementation at different bases, so that manpower planners can more accurately anticipate how changes in recruit quality will affect attrition rates.

### **ORGANIZATION OF REPORT**

The next six sections are organized as follows. Section II describes the conceptual framework, database, and statistical methodology used for the analysis of high-quality attrition trends. Sections III through VI describe trends in high-quality attrition in the Army, Navy, Air Force, and Marine Corps, respectively. Each section examines attrition patterns in the basic training (BT), technical training, and post-training phases of the enlistment term. Separate results are reported for men and women. Section VII draws together the policy implications of the results. The three appendices provide further detail in the form of tables.

## II. RESEARCH METHODOLOGY AND DATABASE

### CONCEPTUAL FRAMEWORK

Military attrition, like civilian job separations, depends on how individual skills and interests interact with service goals and objectives. Neither party can fully anticipate the value of the enlistment match, so it is inevitable that in some circumstances either the recruit or the service will want to terminate the enlistment contract before its expiration. Although military restrictions do not explicitly allow the recruit to quit as can civilian employees, dissatisfied recruits can induce discharge by creating disciplinary problems or reducing their productivity.<sup>1</sup>

Attrition is the result of a reassessment by both the recruit and the service about their initial decision. Separation will occur if both sides are dissatisfied. If one party or the other wants to continue, some compromise may be possible. When replacement personnel are unavailable or the recruit has special skills, the service may give an unproductive recruit extra training and counseling. Similarly, an enthusiastic recruit who is not satisfying service standards may volunteer for extra duty or an unpopular occupation in the hopes of improving his value to the service.

Given the complexities of jobs and working conditions, new job hires are particularly vulnerable to job separations. As new hires learn more about their jobs, they may become disenchanted. Employers have difficulty predicting the productivity of new workers, and they may reassess their hiring decision if observed productivity is too low. The problem is confounded for young hires because they will have less knowledge of their marketable skills and because employers will have less information to predict the new hires' productivity.

The military's reliance on young, relatively inexperienced workers makes it inevitable that a large number of new recruits will not be well-suited to the military. Costly information makes it difficult and undesirable to ensure perfect job matches, but the service and recruit have incentives to strive for stable and productive matches. High levels of attrition are costly to the services and the recruit: the services

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<sup>1</sup>In previous research (Buddin, 1984), the author developed a job matching and firm-specific human capital framework to analyze the separation behavior of military enlistees. A similar approach is summarized here.

must train replacement personnel while enduring unit instability, and the discharged recruit must spend resources looking for a new job.

Whereas some attrition is inevitable, careful monitoring of attrition can reduce attrition costs to the services. Knowledge of how attrition rates differ for various classes of recruits serves three purposes:

- Accession screens are appropriately based on the recruiting cost of various types of recruits relative to their expected military productivity. Nonattrition is an important and readily observable prerequisite for military success.
- By anticipating loss rates from a group of entrants, the services can make opportune recruiting and occupational assignment decisions to avoid serious personnel shortages.
- High risk attrition groups can be targeted for special training or counseling to mitigate their adjustment problems.

If military performance and disciplinary standards were clearly defined and uniformly applied, individual characteristics would be the primary determinants of attrition. In reality, however, some disparity in standards is inevitable when performance is measured and evaluated across hundreds of occupational specialties and disciplinary standards are interpreted across thousands of units at hundreds of bases. Attrition decisions ultimately depend on supervisor judgments, and these judgments may be strongly affected by the quality and availability of replacement personnel.

## DATABASE

The database used in our analysis of high-quality attrition trends is based on the non-prior-service cohort files maintained by the Defense Manpower Data Center.<sup>2</sup> The analysis is based on all non-prior-service high-quality accessions from FY82 to FY85. A high-quality recruit is characterized as one with a high school diploma and a score in the top half of the ability continuum on the Armed Forces Qualification Test.<sup>3</sup> The results reflect attrition that had occurred as of October 1, 1985.

The cohort files contain basic personnel data collected by the services. The primary recruit characteristics that are traditionally useful for attrition analysis are age at accession, race, education level, AFQT

<sup>2</sup>Survey datasets would have allowed greater control for differences in the backgrounds of the high-quality recruits over time, but the datasets are not large or numerous enough to allow an examination of trends in service specific attrition over the last few years.

<sup>3</sup>AFQT scores are normed on the 1980 metric.

score, service, and time in a Delayed Entry Program.<sup>4</sup> Initial occupational assignment is available for the Army and Air Force, but not for the Navy and Marine Corps.

The cohort file was augmented with information on training base assignment and length of training program. Training base assignment was available for all services, but length of training program was available only for the Army and Air Force, where initial occupational assignment is designated.

Service training is divided into two phases. Basic training (BT) provides an initial military orientation, regimentation, and physical fitness training. This phase typically lasts eight to nine weeks in each service (six weeks in the Air Force). Following BT, most recruits receive formal technical training (advanced individual training, or AIT, in the Army) in their occupational specialty. Technical training varies from one to about nine months, depending upon the sophistication of training required. After training, recruits are assigned to units.

## STATISTICAL APPROACH

Our main objective in this analysis is to examine cohort attrition patterns or trends to determine why attrition rates have not declined as anticipated with the improvement in recruit quality. Such an examination might indicate that demand-side or service policy factors have some bearing on the observed rise of attrition rates. This objective influenced our statistical approach in three ways:

1. We restricted ourselves to high-quality recruits so we could concentrate on trends and base differences while holding quality fairly constant.
2. We performed a separate analysis for each service.
3. We analyzed attrition separately for the BT, technical training, and post-training phases of the enlistment term. This separation allowed us to examine how attrition rates differed across training bases, where demand-side factors may possibly shape the attrition rate.

Separate analyses were performed for men and women. Women comprised about 15 percent of high-quality accessions between FY82

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<sup>4</sup>Delayed entry is a program available in each service that allows the recruit to postpone starting active duty for up to one year after signing the enlistment contract. Generally, 80 or 90 percent of all recruits spend time in DEP. Typically, the delay occurs because the recruit wants to finish a school term or a class seat is unavailable in the desired occupational specialty school at the time the enlistment contract is signed.



and FY85. Women have much higher attrition rates than men, and separate specifications meant that statistical parameters were not constrained across genders. Pooled analysis would have also been complicated by the fact that women are ineligible for many occupational specialties and train at fewer bases than men.

Attrition is examined in each service, gender, and training phase by means of logistic regression, where

$$\text{Prob}[Y_i = 1|X_i] = 1/[1 + \exp(-X_i\beta)]$$

represents the probability that the  $i$ th individual recruit with characteristics  $X_i$  will be discharged from the service. In this equation,  $X_i$  is a  $1 \times (k + 1)$  vector,  $\beta$  is a  $(k + 1) \times 1$  vector of estimated parameters, and  $k$  denotes the number of estimated individual characteristics.<sup>5</sup> Individual separation is modeled as a function of individual characteristics as well as service attributes such as occupational and base assignment. Within each service, gender, and training phase, cohort effects are examined with both a fixed effect and full effects model. The fixed effect model has separate intercepts for each cohort but constrains parameters for other individual and service factors to be equal across cohorts. The full effects model estimates a full set of parameters for each cohort separately. This approach facilitates the comparison of base and individual effects across cohorts. In the logistic regression model, the marginal effect of the  $j$ th characteristic on the probability of attrition is  $\beta_j P(1 - P)$ , where  $P$  is the mean attrition probability for the service, gender, training phase, and cohort group.

The technical training phase could not be defined for the Navy and Marine Corps because occupational information was unavailable. For rough comparability with other services, we imputed the technical training phase as the period between BT and the end of six months of service. With this crude imputation we can ascribe basic training base and individual effects to BT, an intermediate training phase, and a post-training phase. The imputation seemed preferable to simply separating the enlistment term in other ways, such as BT and post-BT training.

The choice of cohort groups for this analysis inherently involved some tradeoff. Recent cohorts were chosen because of their relevance

<sup>5</sup>Logistic regression is used in lieu of a linear regression approach because the dependent variable (attrition versus nonattrition) is dichotomous and not continuous. As a result, the linear regression estimates are inappropriate because the variance of the dependent variable is a function of its expectation, and the predicted attrition estimates are not bounded by zero and one. These problems are avoided by the use of logistic regression. The logistic regression model is fitted by means of linear discriminant methodology (Haggstrom, 1983).

for current policies, although unfortunately they cannot be observed to the end of their enlistment term. Of recruits in the FY82 through FY85 cohorts, only the FY82 cohort had significant numbers of recruits who had reached the end of their enlistment terms.<sup>6</sup> Post-training losses are compared at intervals with comparable time at risk. Post-training losses in the first year of service are compared for the FY82 through FY84 cohorts. Post-training losses in the second year of service are compared for the FY82 and FY83 cohorts.

Statistical results are summarized for the Army, Navy, Air Force, and Marine Corps, respectively, in the next four sections. Each section is self-contained; the reader may turn to the section (service) of interest. Regression coefficients are relegated to tables in App. B because of the large number of equations underlying each section.

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<sup>6</sup>For attrition purposes, the end of the term (ETS) is sometimes characterized as the completion of three years of service, although most recruits have four-year enlistments. Even under this loose concept of ETS, recruits from the FY83, FY84, and FY85 cohort had not completed three years of enlistment by the time our dataset was constructed in the fall of 1985.

### III. TRENDS IN ATTRITION OF HIGH-QUALITY ARMY RECRUITS

In 1984, the Army became concerned that marked improvements in recruit quality were not resulting in the expected reductions in recruit attrition. This concern led the Commanding General of the Army's Training and Doctrine Command (TRADOC) to form a study group to analyze the Army's discharge policies and practices during basic training and advanced individual training. An Army study team was formed and spent the next several months visiting bases and collecting information on programs and practices that affected training attrition rates.

The Army study (Trainee, 1984) was completed in the fall of 1984. The study team recommended a new Army training attrition program containing four main elements:

- *Positive leadership*—The group found that leadership efforts encouraging reasonable progress and standards led to lower overall attrition (with no sacrifice in military standards) than did high stress leadership focusing on recruit shortcomings.
- *Physical conditioning*—The group found that many recruits fell behind and became discouraged because they were not in adequate physical condition for basic training. A remedial prebasic physical fitness program was instituted for recruits who did not meet minimum fitness standards when they arrived at the basic training center.
- *Evaluation*—Many recruits were being discharged promptly without adequate evaluation, counseling, and remediation. The group recommended that discharges be sharply discouraged during the first four weeks to ensure that the Army spent a fair amount of time assessing the recruit's potential.
- *Experienced leadership*—The group found that drill sergeant instruction should be improved and that relatively inexperienced, E-5 drill sergeants had more problems with attrition than E-6 drill sergeants.

The study recommendations were endorsed by TRADOC and implementation began in December 1984.

The sharp Army reduction in 6-month attrition for the FY84 and FY85 cohorts reflects at least in part the explicit or implicit effect of the Army study. Since the premise of the study was that attrition was

probably too high, the study and site visits turned training base attention to possible methods for reducing attrition. Some of the reforms, such as drill sergeant retraining and remedial physical education, were implemented gradually into FY85, and probably did not contribute much to the attrition reduction. The degree of reduced attrition, however, coupled with Army assertions that training standards have not been sacrificed, provides evidence that service policies as well as recruit quality have an important bearing on attrition rates.

The ultimate efficacy of the Army's new program cannot be tested without careful recording of what training base arrangements were in effect as each recruit passed through the training system. A follow-on effort would also be needed to assess whether the observed reduction in training losses led to higher loss rates in the post-training phase. If so, then the new program is not producing much of a systemwide gain. Nevertheless, the current analysis will allow us to document some of the short-range attrition adjustments associated with the FY85 policy changes.

## BASIC TRAINING

An Army recruit's occupational assignment determines his or her BT and AIT base assignment. Most specialties are taught only at one location, and BT assignments are made near the appropriate AIT school. In a few large occupations, such as combat specialties, recruits are assigned to a one-station unit training (OSUT) program, which means that BT and AIT are combined in the same unit at the same location. OSUT comprises about 30 percent of all recruit training, but virtually no OSUT is available in occupations open to women. A few other occupations also provide advanced individual training at the same sites as basic training, so another 25 percent of recruits stay at their BT base for AIT.

The occupational designation of recruits assigned to the Army's eight basic training bases varies considerably because base assignments are based on occupational assignments. The occupational distribution at each BT base is described in Tables 6 and 7 for men and women, respectively. For men, infantry training is dominant at Forts Benning, Bliss, and Sill; Fort McClellan gets a disproportionate share of trainees with assignments in the service/supply handler areas. Most women assigned to McClellan also have service/supply handler specialties, whereas women assigned to Fort Leonard Wood are predominantly in

**Table 6**  
**OCCUPATIONAL DISTRIBUTION FOR HIGH-QUALITY ARMY MEN BY BT BASE**  
**(Percent)**

Occupation Group	Basic Training Base								Total
	Benning	Bliss	Dix	Jackson	Knox	Wood	McClellan	Sill	
Infantry	100	47	1	0	34	20	0	50	31
Electronics	0	18	11	14	3	5	6	8	7
Communications/ intelligence	0	8	23	23	21	20	11	29	17
Medical/dental	0	13	5	12	2	8	2	1	5
Other technical	0	1	3	2	2	2	4	7	2
Support/administration	0	4	10	18	18	12	2	2	9
Electrical/mechanical equipment repair	0	7	32	26	15	16	11	3	15
Craftsmen	0	0	2	0	0	8	0	0	2
Service/supply handler	0	2	13	5	5	9	84	0	12

communications or intelligence specialties.<sup>1</sup> Nevertheless, BT skills taught and formal evaluations do not vary much across bases or over time.

Figures 2 and 3 summarize the general trends in the level and composition of BT attrition for men and women from FY82 through FY85. Although women's attrition is higher than men's, the general patterns of cohort changes are similar for both groups. As with 6-month attrition results reported earlier, BT losses rose in FY83 and then fell in FY84 and FY85 as the Army became concerned with the level of training losses and implemented its new program. Before FY85, most BT losses were characterized as trainee discharges, a catchall category for unsatisfactory conduct or performance during training. Most of the reduction in BT losses have occurred because trainee losses have declined sharply. By FY85, most BT losses were for medical reasons.

<sup>1</sup>The Army ended women's basic training at Fort Leonard Wood after FY82.

**Table 7**  
**OCCUPATIONAL DISTRIBUTION FOR HIGH-QUALITY ARMY WOMEN**  
**BY BT BASE**  
**(Percent)**

Occupation Group	Basic Training Base				Total
	Dix	Jackson	Wood	McClellan	
Infantry	2	1	0	1	2
Electronics	5	8	2	4	6
Communications/ intelligence	19	25	50	13	22
Medical/dental	14	18	26	14	16
Other technical	2	2	2	2	2
Support/administration	26	32	11	14	27
Electrical/mechanical equipment repair	14	8	2	6	9
Craftsmen	1	0	1	0	0
Service/supply handler	17	7	6	46	16

### Cohorts

The regression results bear out the simple trends described in Figs. 2 and 3. BT attrition rates vary significantly by cohort after controlling for differences in recruit quality, occupational assignment, and training base. For men, BT loss rates were about 1 percentage point higher in FY83 and about 2 percentage points lower in FY85 than in either FY82 or FY84. A similar pattern occurs for women: Their losses were 2 points higher in FY83 and FY84 and 3 points lower in FY85 than in FY82.

### Training Bases

Training base effects, like cohort effects, suggest that institutional factors may play an important part in attrition levels. Figure 4 shows how attrition rates for men vary by base and cohort. Fort Jackson has BT loss rates consistently above the cohort means, whereas Bliss,

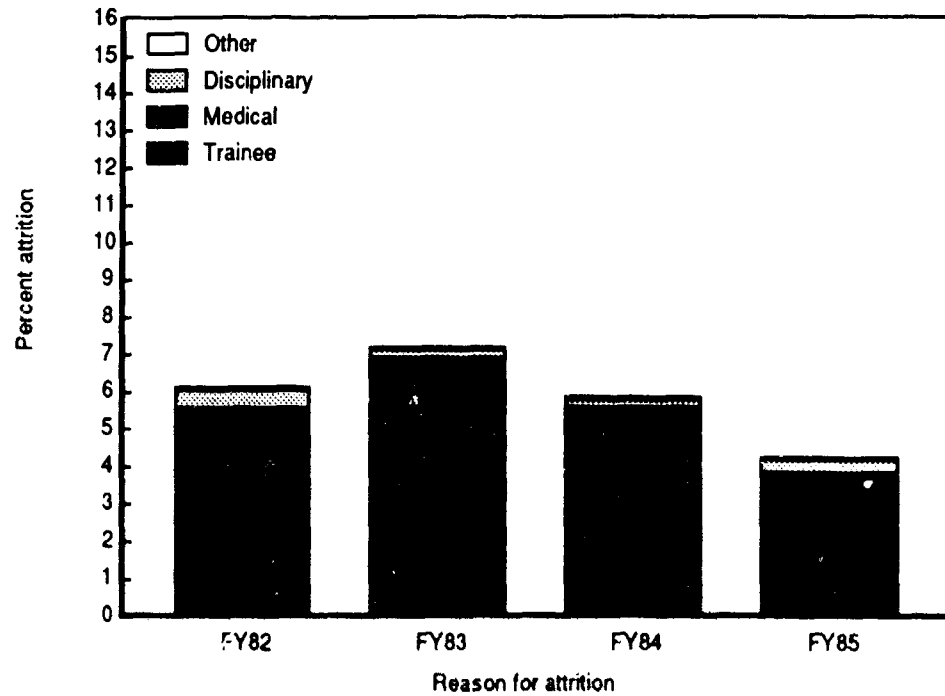


Fig. 2—Trends in basic training attrition: high-quality Army men

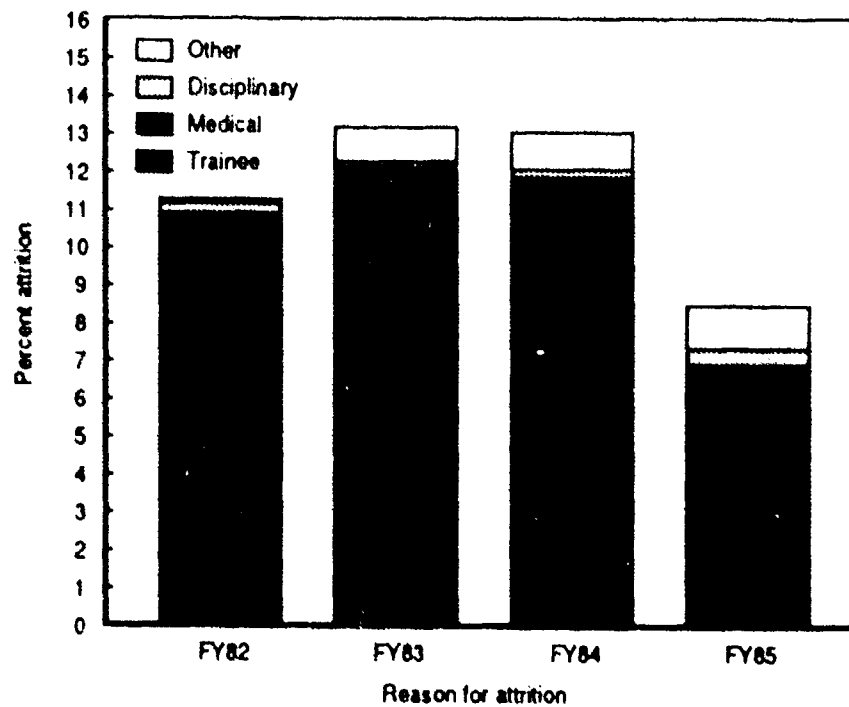


Fig. 3—Trends in basic training attrition: high-quality Army women

McClellan, and Sill typically have low attrition rates.<sup>2</sup> The range of variation is quite large. For example, in FY84, Jackson's recruits left the Army at a rate 8 percentage points higher than the Army mean of 5.9 percent, whereas McClellan and Bliss' trainees left at rates 3.5 and 2 percentage points lower than the mean. Along with the reduction in BT attrition in FY85, the variance in the attrition rate across training bases has declined. Nevertheless, large and continuing attrition rate differences across training bases and at the same base over time may indicate differences in attrition practices.

Figure 5 shows that women's BT attrition also varies substantially by training base. Interestingly, the pattern for women is similar to that of men, with Fort Jackson having persistently above average attrition rates and Fort McClellan having persistently below average rates.<sup>3</sup> The results indicate a 16 percentage point difference in the BT loss rate of comparable quality women assigned to Fort Jackson versus Fort McClellan in FY83. The variance in women's BT attrition rate across bases has also been reduced in the most recent cohort.

### Occupation

In addition to cohort and base variables, the regression model controls for differences in occupational assignment. Since BT is a general orientation to Army life, BT and BT evaluations do not vary with occupational specialty. Attrition rates might vary with occupation, however, because recruits might be less discouraged with BT problems if their subsequent occupational assignments are desirable or substantially different than BT. For example, a recruit might endure BT physical regimentation for a desirable and less physically demanding job in communications or intelligence. A similar recruit might be discouraged if faced with the prospect of a physically demanding occupation such as infantry.

Occupational differences in BT losses are fairly small for high-quality men and women. For men, electronics and electrical/mechanical equipment repair areas have BT losses 1 percentage point lower than average. Service/supply handler specialties have losses 2 percentage points higher than average for both men and women. For the most part, however, BT attrition rates do not vary significantly with occupational assignment.

<sup>2</sup>Benning trains only combat arms personnel, so the effects of training base are indistinguishable from those of combat arms assignment. A broader occupational mix is assigned to other bases, so occupational variables in the regression model can adjust for different attrition riskiness associated with occupational assignment.

<sup>3</sup>The Army did not train women at Fort Leonard Wood after FY82.



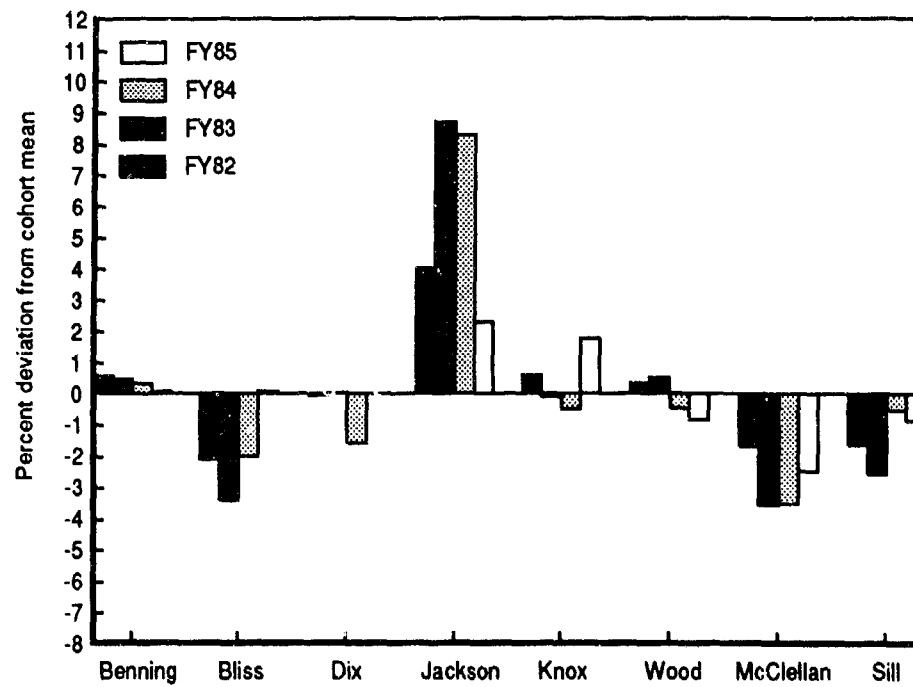


Fig. 4—Basic training attrition by base and cohort: deviations from cohort mean for high-quality Army men

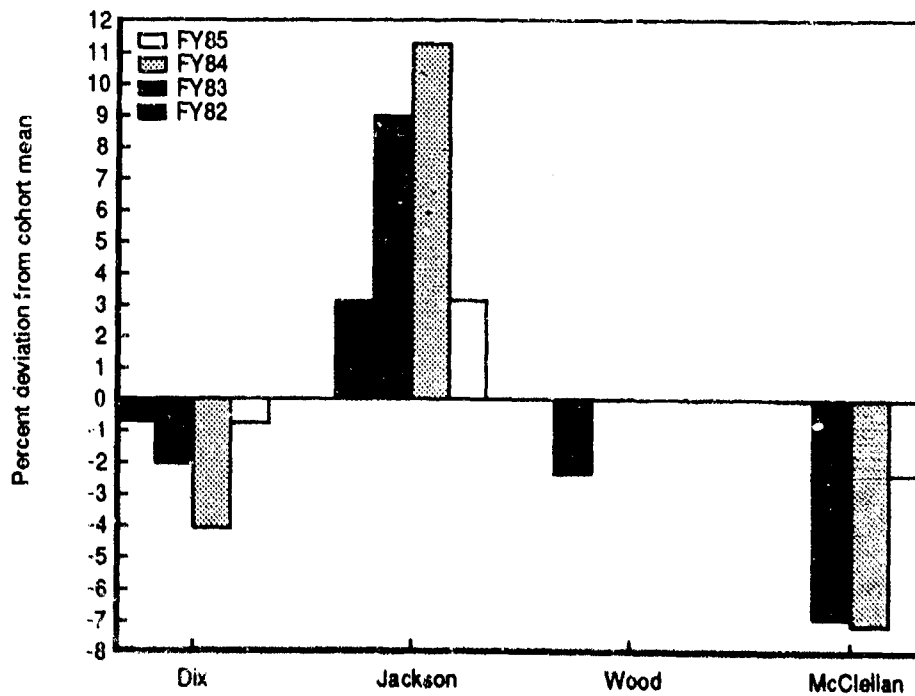


Fig. 5—Basic training attrition by base and cohort: deviations from cohort mean for high-quality Army women

### Recruit Characteristics

Individual characteristics have similar effects across all cohorts.<sup>4</sup> Black men and women have attrition rates 2 and 7 percentage points lower, respectively, than their white counterparts. Recruits over age 20 have BT attrition 1 and 2 points above average for men and women. Recruits with some college have lower attrition than those high-quality recruits with only a high school diploma. Finally, AFQT has a negative, but small, effect on BT attrition rates. For men, a 20 point change in AFQT is associated with only a 1 point reduction in BT attrition. A 10 point increase in women's AFQT would be predicted to reduce women's attrition by a point.

### ADVANCED INDIVIDUAL TRAINING

The length of Army specialty training depends on occupation. Training time is short for skills such as infantry and long for electronics skills. Course length ranges from one to nine months, with average training requiring about three months. Physical training begun in BT is continued into AIT. AIT graduates are qualified in a specific military occupation after demonstrating academic and hands-on abilities in the skill as well as passing a physical fitness test.

The TRADOC attrition study covered AIT practices as well as BT attrition, and AIT attrition has also fallen under the new program. Figures 6 and 7 show the general cohort patterns in AIT attrition before adjusting for cohort composition. AIT attrition rates are much lower than BT rates, and women continue to have much higher attrition than men. AIT attrition has fallen consistently for each entry cohort since FY82 with most of the improvement occurring in the trainee discharge category. Many recruits in the FY83 entry cohort went through AIT in FY84, and they may have benefited from the same factors that reduced BT losses in FY84.

### Cohorts

The regression results show significant cohort effects for AIT attrition rates of both men and women, although the size of the effects (like AIT rates) is much smaller than in basic training. For men, AIT

<sup>4</sup>These effects are similar to those reported in other attrition studies. The variables are important controls in our model, but we are less interested in their effects per se as in their allowing us to estimate cohort and base effects. For this reason, the effects of individual characteristics are only summarized here. A broad interpretation of these variables and previous attrition literature is available in Buddin (1984).

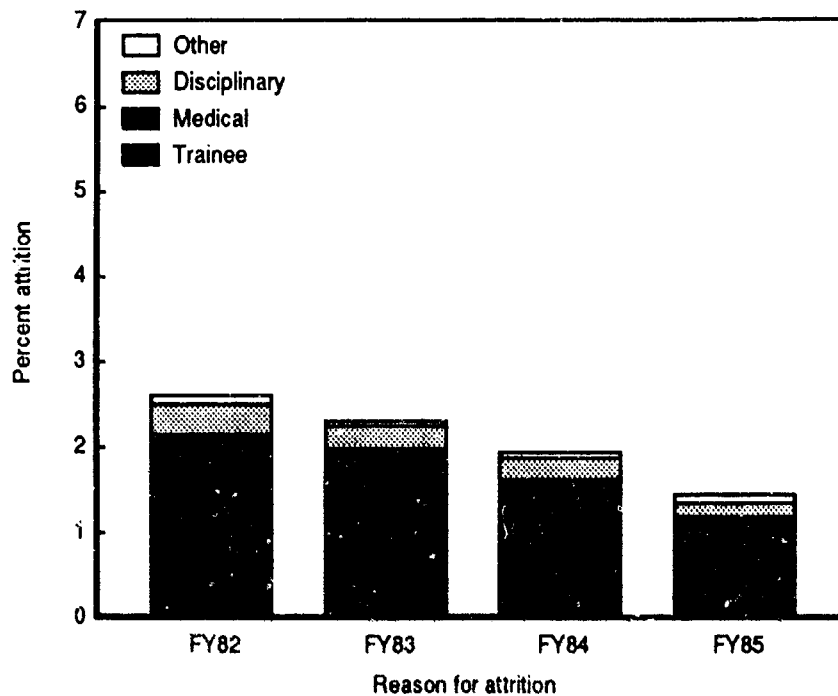


Fig. 6—Trends in AIT attrition: high-quality Army men

attrition rates have fallen consistently since FY82 with rates 0.3, 0.5, and 1.1 percentage points lower in FY83, FY84, and FY85, respectively. AIT attrition rates for women were 1.1 and 2.5 percentage points lower in FY84 and FY85, respectively, than in FY82 or FY83. Although the rates are low, they reinforce BT cohort effects, so that trained personnel available from comparable quality recruits vary considerably from cohort to cohort.

### Basic Training Bases

An important attrition issue is whether high early attrition rates are associated with lower subsequent attrition rates, as only the more skilled, disciplined, and well-suited recruits survive the weeding-out process. Figures 8 and 9 demonstrate that AIT attrition rates provide little support for the weeding-out hypothesis. For men, Bliss' recruits had below average BT attrition and average AIT attrition, Jackson's recruits had high BT and AIT attrition rates, and McClellan's recruits

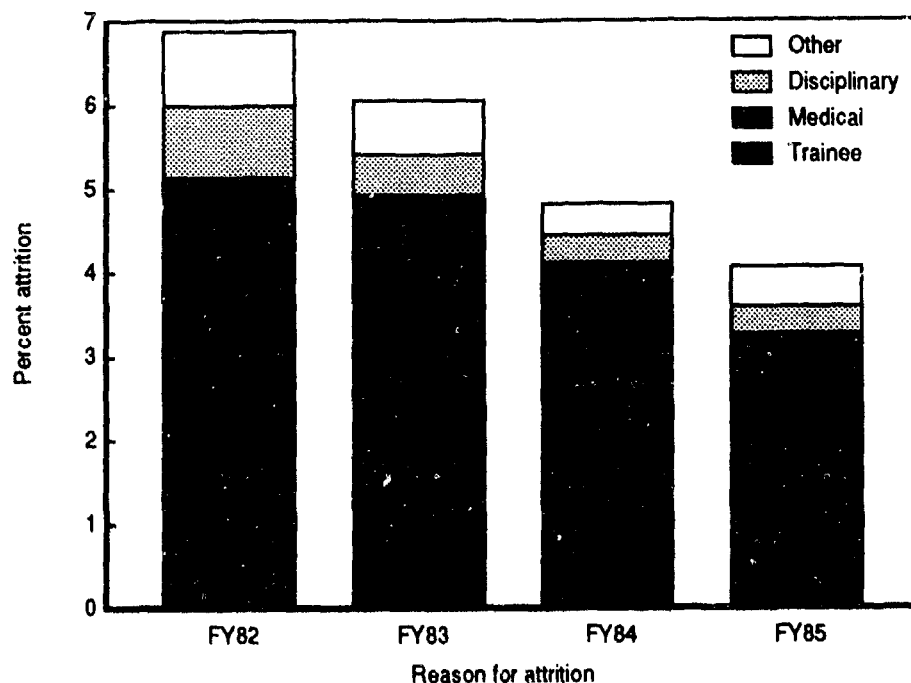


Fig. 7—Trends in AIT attrition: high-quality Army women

had low BT and high AIT rates relative to the averages. Similarly, there is no strong relationship for women between the recruit's BT base and subsequent attrition.

Another approach was used to assess whether tough BT training policies had any bearing on advanced individual training losses. A regression variable was constructed that corresponded to the monthly attrition rate for men and women at each BT base. The variable was included in the AIT regression specification to test whether higher BT attrition tended to reduce AIT attrition. The BT attrition rate variable had small and typically statistically insignificant effects on AIT attrition for both men and women. For men, monthly BT attrition at the recruit's training base was insignificant in each cohort but had a small positive effect across all cohorts combined. Overall, a 1 percentage point increase in BT attrition at the training bases was associated with only a 0.05 percentage point increase in AIT attrition. For women, monthly BT attrition at the training base was insignificant overall in the FY84 and FY85 cohorts. In FY82 and FY83 cohorts, a 1

percentage point increase in monthly BT attrition at the training bases was associated with a 0.2 and 0.4 percentage point reduction in AIT attrition rates.

### Training Length and Occupation

As expected, recruits in long training programs have higher AIT attrition rates than those in short programs because they are at risk for a greater period of time. Occupational differences in AIT attrition rates are relatively small and there are no persistently significant differences across all four cohorts. For men, there is some tendency for medical and dental courses to have below average attrition. Service/supply handler courses have above average losses. Women in electronics, electrical/mechanical equipment repair, and service/supply handler specialties have high AIT attrition rates, while medical occupations have below average attrition.<sup>5</sup>

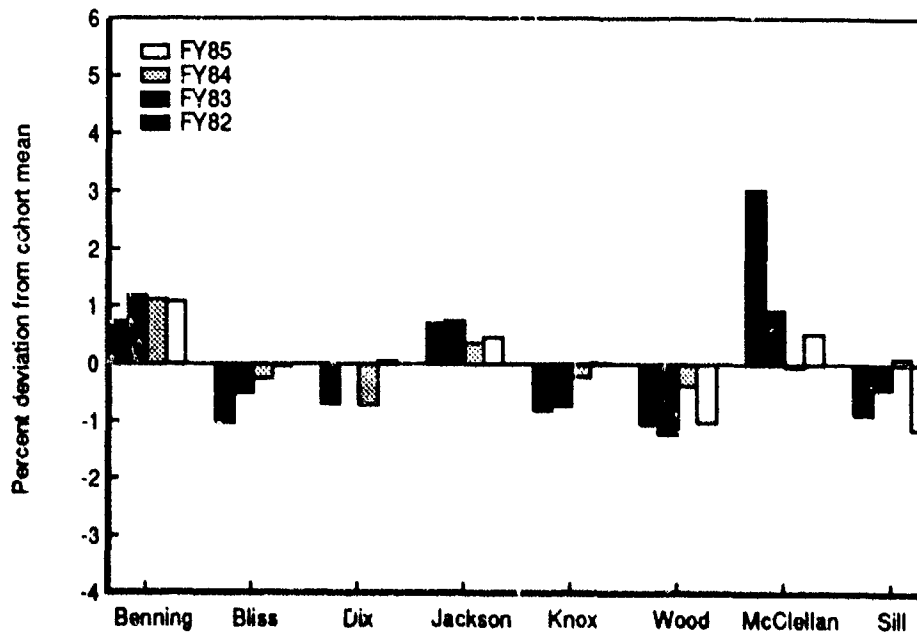


Fig. 8—AIT attrition by BT base and cohort: deviations from cohort mean for high-quality Army men

<sup>5</sup>In other unreported results, attrition differences were estimated across training schools in place of occupational groups. The results for the training schools corresponded closely with the reported results for occupational groups. Training school effects were typically insignificant, and there were no persistent trends across cohorts by AIT school. For men, losses tended to be lower at Fort Devens (intelligence) and Fort

### Recruit Characteristics

Individual recruit characteristics have nearly the same effects on AIT attrition rates as on BT attrition rates. Blacks continue to have lower attrition than whites. Older recruits have above average loss rates. Some schooling beyond high school is associated with reduced attrition. AFQT<sup>7</sup> again has a statistically significant although small effect on attrition in AIT.

### POST-TRAINING

As discussed in Sec. III, a complete post-training attrition follow-up is not possible for most of our cohorts, because the recruits have not yet reached the end of their enlistment terms. Our post-training analysis is divided into two parts: post-training attrition during the first year of active duty for the FY82 through FY84 cohorts, and two-

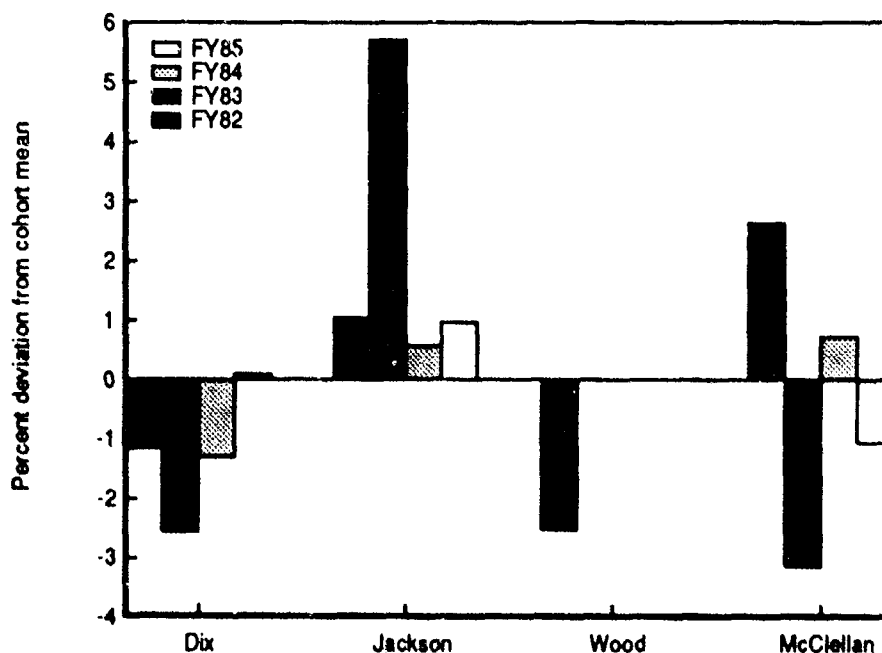


Fig. 9—AIT attrition by BT base and cohort: deviations from cohort mean for high-quality Army women

Eustis (transportation), and higher at Fort McClellan (law enforcement). For women, AIT losses were also lower at Devens and higher at McClellan.

year post-training attrition for the FY82 and FY83 cohorts.<sup>6</sup> Unfortunately, post-training attrition information was not available for the FY85 cohort; an issue of key policy importance is whether the lower training losses in the FY85 cohort will be followed by higher subsequent post-training losses.

### Cohorts

For men, one-year post-training attrition rates for the FY82 through FY84 cohorts are about 4 percent, and these rates were about 0.3 percentage point lower in FY83 and FY84 than in FY82. Two-year post-training attrition rates are about 10 percent for FY82 and FY83. Attrition rates are about a 0.5 percentage point lower in FY83 than FY82 after controlling for the composition of these high-quality recruits.

The post-training attrition rates, like the training attrition rates, are higher for women than for men. One-year post-training losses are about 7.5 percent, and two-year post-training rates are 17.5 percent. There are no significant cohort differences in post-training attrition rates for high-quality Army women.

### Basic Training Bases

For men, training base environment does have an effect on post-training attrition. The BT base has a small, but significant effect. Combat arms graduates from Benning have one- and two-year post-training losses 0.6 and 0.9 percentage points above average, respectively. Jackson's BT graduates have post-training attrition 0.8 and 0.5 percentage points above average in the one- and two-year training phases. McClellan's graduates have losses 0.9 and 2.5 points below average BT graduates for one- and two-year post-training losses. Sill's BT graduates have attrition rates 0.4 and 1.5 percentage points higher than average for one- and two-year post-training losses, respectively.<sup>7</sup>

Do high BT attrition rates mean that BT graduates have lower subsequent post-training attrition rates? Apparently not. Above average BT attrition rates at Jackson are followed by above average post-training attrition rates for Jackson's graduates. Below average BT

<sup>6</sup>The two-year post-training attrition rate is defined as the ratio of the number of separations between the end of AIT training and the completion of the second year of active duty divided by the number of recruits completing AIT.

<sup>7</sup>Benning's graduates have post-training attrition rates very comparable to those of Sill. BT at Benning is restricted to recruits in combat arms specialties, so higher post-training losses could be ascribed to either training base or occupational effects. At other bases, BT graduates become occupationally qualified in an array of occupational areas, so base and occupational effects are more readily separable.

rates at McClellan are reinforced by below average post-training rates for McClellan graduates. The below average BT rates at Sill are contrasted with the above average post-training rates of Sill's BT graduates. In sum, men's post-training attrition rates do differ by BT base, but policies, as reflected in higher BT attrition rates, do not have a predictable effect on post-training losses.

Further evidence of men's training base effects is available from consideration of the base and gender specific BT losses during the recruits' entry month. The coefficients for this variable are negative and significant, an indication that high BT losses are associated with lower subsequent post-training attrition. The size of these effects is very small, however. A 1 percentage point increase in BT attrition rates would be expected to reduce one- and two-year post-training attrition rates by about 0.2 and 0.3 percentage points, respectively.

The large and substantive changes in the Army's training policies mean that men's post-training attrition rates in the FY85 cohort cannot be anticipated with much accuracy. Nevertheless, the evidence from the FY82 through FY84 cohorts suggests that the reduction in BT and AIT losses as a result of the FY85 policy initiatives should not appreciably increase post-training attrition rates.<sup>8</sup> If so, the new Army program has substantially increased the productive person-years available from the FY85 pool of high-quality recruits relative to previous years.

There is little evidence that basic training base has any bearing on the post-training attrition of women. The coefficients for individual training bases are uniformly insignificant for all cohorts and in the fixed effects cohort model. The training base BT attrition rate from the month that each woman entered BT does have a small but significant effect on post-training attrition rates in FY82 but not in subsequent cohorts. The implication is that the lower training attrition rates in FY85 may *not* be offset by higher post-training attrition rates.

### Occupation

Post-training attrition does not vary much with occupational category for either men or women, and these small occupational differences are not persistent across cohorts. For men, the communications/intelligence and supply handler/administration specialties have post-training attrition rates above average, and electrical/mechanical equipment repair occupations have below average attrition rates. These differences are only 0.5

<sup>8</sup>Baldwin and Daula (1984) also report that lower training attrition is not necessarily associated with higher post-training attrition.



percentage point for one-year post-training attrition and become insignificant for two-year post-training attrition.

For women, post-training attrition rates are about 1 percentage point below average in the medical/dental and supply handler/administrative occupations. Loss rates in the communications/intelligence area are slightly above average. The size and pattern of the occupational effect for women are similar in one- and two-year post-training attrition.

### **Recruit Characteristics**

For both men and women, individual characteristics have the same types of effects on post-training attrition rates as on BT and AIT attrition rates. Recruits who were over age 20 when they entered the service have above average post-training attrition rates. Blacks' below average attrition profile continues into the post-training phase. High-quality recruits with some post-high school education have below average post-training attrition. Finally, AFQT has a negative effect on post-training attrition.

Participation in a Delayed Entry Program reduces the likelihood of post-training attrition for both men and women. DEP participants may be better matched with their military occupations than other recruits, by virtue of their willingness to wait for a desirable occupation before entering active duty. Alternatively, DEP participants might be more circumspect than non-participants, planning their career moves ahead of time and not impulsively joining the military following the loss of a job or the end of a school term.<sup>9</sup>

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<sup>9</sup>DEP losses are discussed at greater length in Buddin (1984).

#### **IV. TRENDS IN ATTRITION OF HIGH-QUALITY NAVY RECRUITS**

The interpretation of Navy attrition patterns is tempered by the lack of available information on occupational assignment. BT assignment in the Navy is dependent on recruit proximity to a technical training school, so the occupational distribution differs across BT training schools. Also, some of the estimated individual effects might be distorted by the absence of appropriate occupational information.

Unlike the Army, Navy attrition and training policies were stable over the period from FY82 through FY85. Six-month attrition in the Navy increased slightly during this period, although the percentage of high-quality recruits rose for both men and women.

#### **BASIC TRAINING**

Figures 10 and 11 show the general overall trend in the level and composition of Navy BT attrition rates for high-quality recruits. The BT rate has increased about 1.5 percentage points for men and 1 percentage point for women. The composition of Navy losses is different from the Army's, and the composition changes somewhat over time. The Navy has few medical discharges for either men or women. In FY82, the trainee discharge category was hardly used for women, and disciplinary discharges were much more common than in the Army. From FY83 on, the change in disciplinary losses was largely offset by change in trainee discharges.

The category of other discharges is much larger in the Navy than in the Army, reflecting a large number of Navy discharges for "erroneous enlistment." These discharges presumably reflect unknown preenlistment conditions that would have made the recruit ineligible for the Navy.<sup>1</sup> In recent cohorts, 40 percent of the high-quality men and 20 percent of the high-quality women discharged during basic training are categorized as "erroneous enlistments." If taken at face value, the Navy could substantially cut basic training attrition if it more carefully screened its enlistees. The Navy ostensibly loses 10 times as many high-quality male enlistments because of "erroneous enlistment" as the Air Force. A more likely explanation is that the services mean

<sup>1</sup>Navy regulations require that any recruit deception in misleading the service about enlistment qualifications should result in dismissal for "fraudulent entry."

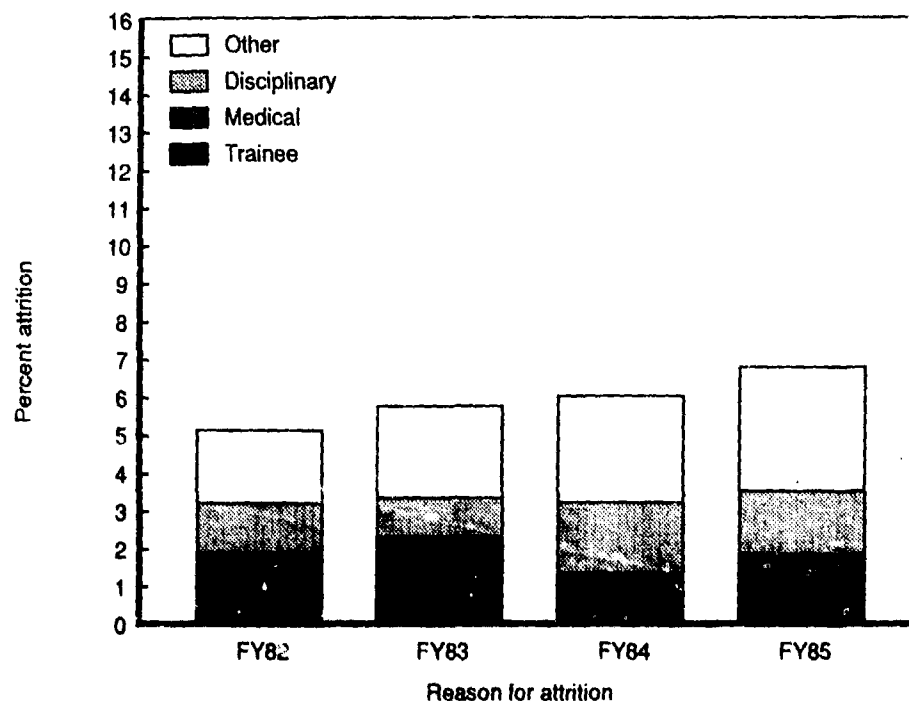


Fig. 10—Trends in basic training attrition: high-quality Navy men

different things by "erroneous enlistment," and that circumstances underlying dismissal for one reason in one service might be categorized differently in another service (Comptroller, 1980).<sup>2</sup>

### Cohorts

The regression results reiterate the BT attrition rate increase of about 1.5 percentage points for men. For women, BT losses rose 1

<sup>2</sup>Appendix C shows how the reasons for BT attrition vary by service. Differences between services are striking. For example, 1 percent of BT losses among Army men are coded as fraudulent entry, compared with 12 percent of Navy losses. On the other hand, medical disqualifications account for 6 and 37 percent of Navy and Army BT losses, respectively. If these differences do not reflect coding inconsistencies across services, then some services are much better at screening out problems that others overlook.

A case can be made that discharges for "erroneous enlistment" should not be counted as attrition. By definition, the performance or conduct of the recruit is not an issue in these circumstances. In effect, the enlistment contract is simply invalid after new information about the recruit becomes known. The present research includes these discharges in the attrition definition primarily because the author believes that the Navy is using this explanation for discharges that are categorized differently in other services.

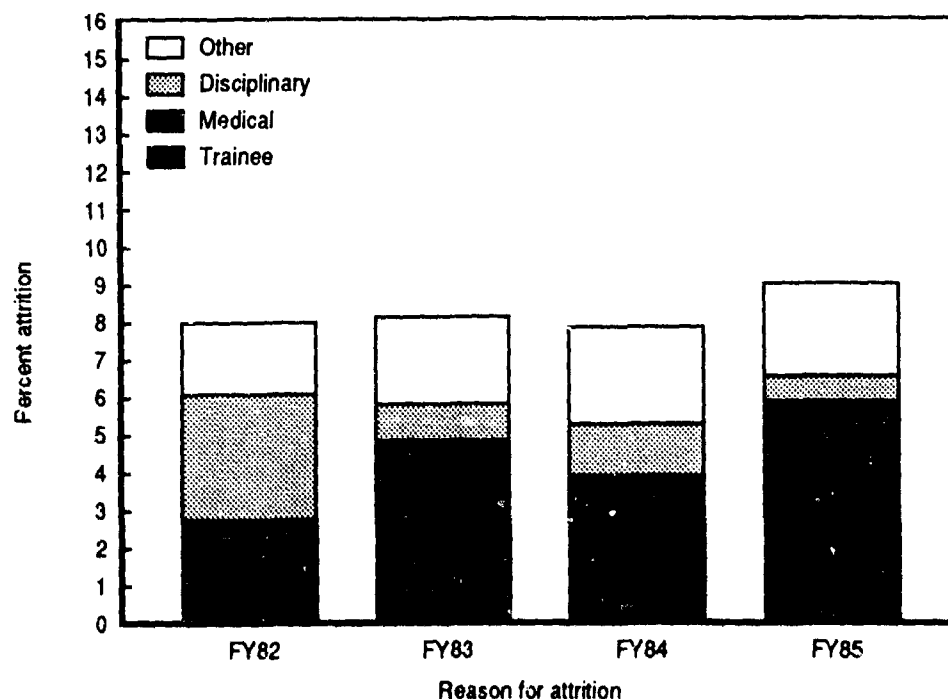


Fig. 11—Trends in basic training attrition: high-quality Navy women

percentage point after controlling for changes in the composition of the different cohorts.

### Training Bases

Figure 12 shows how men's BT attrition rates differ by training base and cohort over time.<sup>3</sup> Averaging over the four years, men assigned to Great Lakes Naval Training Centers (NTC) have BT attrition rates about 0.8 percentage point lower than the overall average. The San Diego NTC averaged 0.7 percentage point above average. The base pattern varies substantially from year to year. BT rates were 0.9 percentage point below average at Orlando NTC in FY82, but 0.7 percentage point above average the following year. Great Lakes NTC has been consistently below average, but only significantly so in FY83 and FY85. San Diego NTC had rates about 1 percentage point above

<sup>3</sup>All Navy women are assigned to Orlando for basic training.

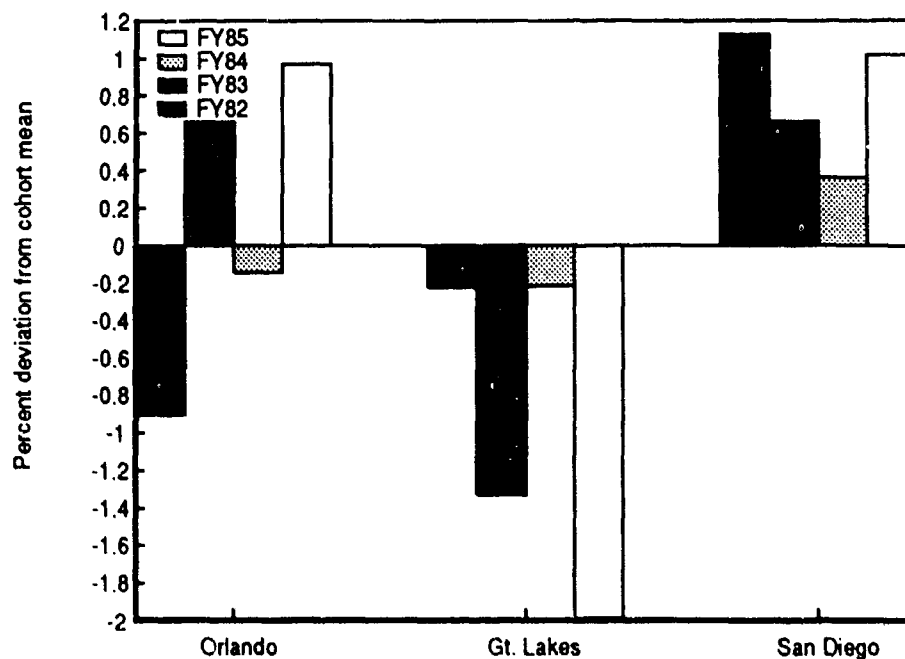


Fig. 12—BT attrition by base and cohort: deviations from cohort mean for high-quality Navy men

average in FY82, FY83, and FY85. Within any given year, comparable quality recruits have BT attrition rates 2 to 3 percentage points higher if assigned to one base rather than another. In FY83, BT attrition rates did not significantly differ by BT base.

#### Recruit Characteristics

For men, individual recruit characteristics have effects in the Navy similar to those in the Army. Recruits who are age 21 or older consistently have BT loss rates about 1.5 percentage points above average, and 17-year-old recruits have losses about 1 percentage point below average. BT losses do not differ much for blacks and whites, with black BT loss rates 0.6 percentage point below those of whites. Post-high school education and AFQT have a negative effect on BT attrition. DEP participants have lower BT attrition than nonparticipants.

Recruit characteristics have a similar effect on the BT attrition of Navy men and women. Women who are 21 or older have loss rates about 1 percentage point above average. A 13 percentage point change in AFQT is associated with a 1 percentage point reduction in BT attrition. Education and DEP participation also have negative effects on BT losses.

## TECHNICAL TRAINING

As with civilian separations, military separations decline sharply with job tenure, so it is not surprising that Navy attrition during months three through six is not as great as during BT. The rates follow the same general trend as BT rates, although the increases are quite small for both men and women (see Figs. 13 and 14). The composition of losses also follow the pattern established in BT.

### Cohorts

Cohort patterns in technical training attrition followed closely the pattern in BT attrition. After controlling for cohort demographic differences, the technical training attrition rate for men is about 0.3, 0.2, and 0.4 percentage points higher in FY83, FY84, and FY85, respectively, than in FY82. For women, BT losses were 0.6 percentage point higher in FY85 than in the previous cohorts.

### Basic Training Bases

BT base has little effect on subsequent AIT attrition rates. Over all four cohorts, Orlando's BT graduates have AIT attrition rates 0.1 percentage point above average, while Great Lakes' graduates have AIT rates 0.2 percentage point below average. Within most cohorts, however, BT base effects are typically insignificant. Similarly, differences in BT attrition rates during the recruit's BT period have no effect on technical training loss rates. This means that unusually high or low BT base rates are not offset by differences in technical training attrition rates.

All Navy women have BT at Orlando, so BT bases cannot be compared. As with men, the BT pass rate has no effect on technical training loss rates.

### Recruit Characteristics

Individual characteristics have effects on technical training attrition similar to those on BT attrition for both men and women. For men, loss rates are above average for recruits over age 20 and below average for recruits with some post-high school education or high AFQT. Individual characteristics of women have few significant effects on technical training attrition in any cohort or in the pooled fixed effects model.

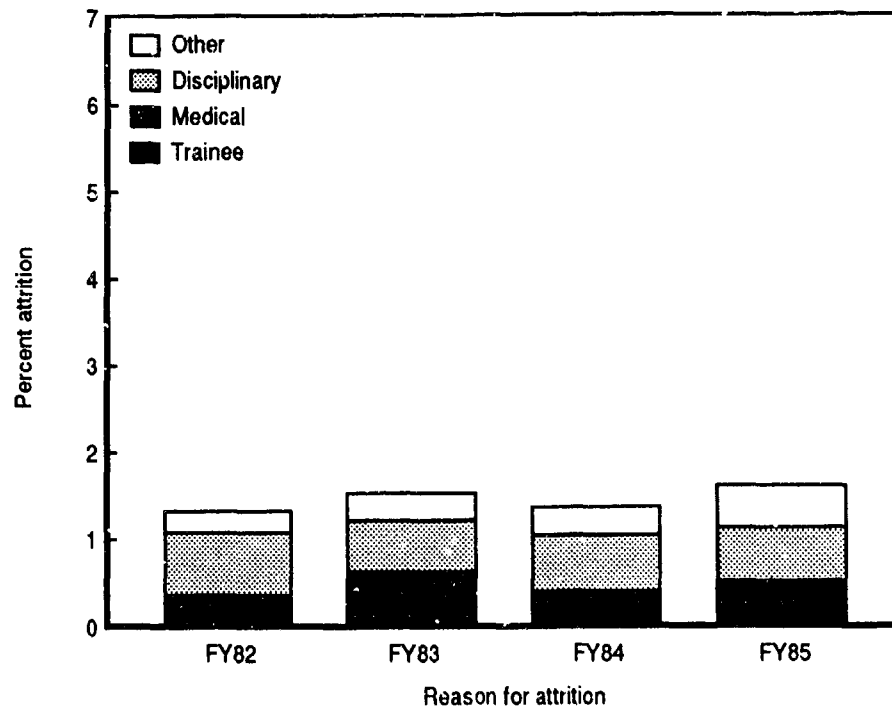


Fig. 13—Trends in technical training attrition: high-quality Navy men

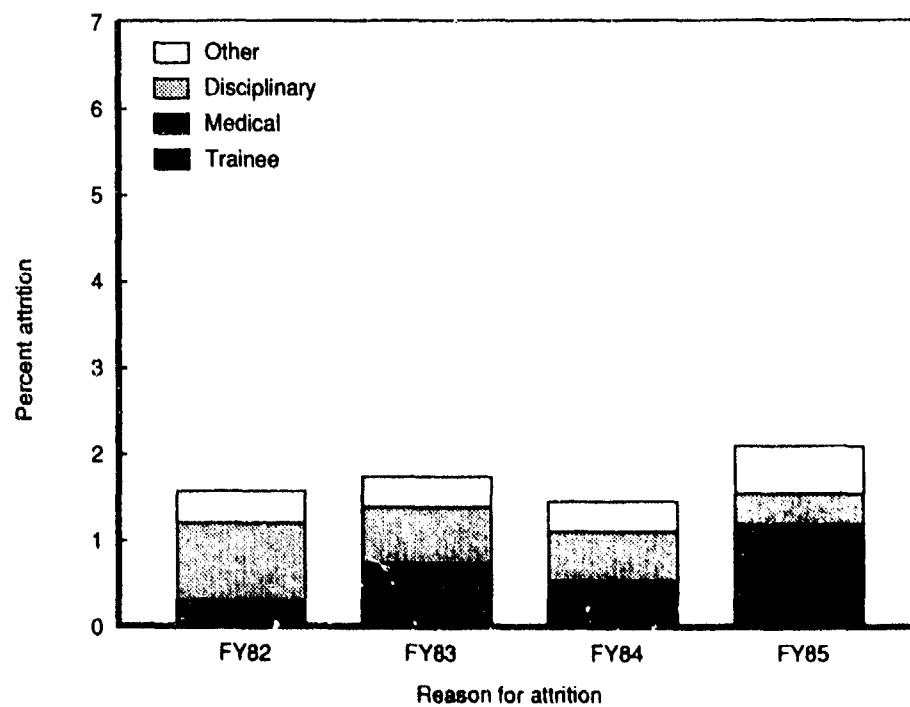


Fig. 14—Trends in technical training attrition: high-quality Navy women

## **POST-TRAINING**

### **Cohorts**

Cohort patterns in post-training attrition are weak for Navy men and women. For men, two-year post-training attrition does not differ between the FY82 and FY83 cohorts. Two-year post-training attrition rates for women were 1 percentage point higher in FY83 than in FY82. One-year post-training attrition for men is about 0.5 percent higher in FY84 than in either FY82 or FY83. For women, one-year post-training attrition was 1 percentage point higher in FY83 than in FY82, after controlling for differences in the quality composition of the cohorts.

The pattern of cohort effects across BT, technical training, and post-training attrition shows that the higher recent levels of BT and technical training losses are not being offset by lower levels of post-training attrition. For men and women, there is little trend in post-training rates, and some evidence (e.g., one-year post-training rates for men) that post-training rates might be rising.

### **Basic Training Bases**

Basic training bases have no lingering effects on post-training attrition rates in any cohort or in the pooled fixed-cohort effects model. BT attrition rates during recruit training also have no significant effect on subsequent recruit post-training attrition. Above or below average training losses have no bearing on post-training attrition rates, so higher training attrition rates in recent cohorts will probably not be offset by any reduction in post-training attrition rates.

### **Recruit Characteristics**

For men, individual characteristics have effects on post-training attrition similar to those on training attrition, although fewer variables are significant. One interesting exception is that recruits who were age 17 at accession have post-training attrition rates significantly above average. These young and presumably less experienced recruits have below average BT attrition rates, but they are less likely to complete their terms than the average BT graduate.



Individual characteristics explain little of the variation in women's post-training attrition rates. The only exception is race. Black women have one- and two-year post-training attrition rates 1.5 and 4.8 percentage points lower, respectively, than white women. Women who were better educated or had higher AFQT test scores had lower post-training attrition rates.

## **V. TRENDS IN ATTRITION OF HIGH-QUALITY AIR FORCE RECRUITS**

Unlike the other services, the Air Force trains all new recruits at the same location, Lackland Air Force Base, Texas. Implementation of Air Force attrition policies may be more or less uniform than that of the other services, but we cannot use differences in BT attrition rates at various bases as a proxy for differences in the implementation of service policies as in the other services.

The cohort files do contain information on occupational assignments of Air Force recruits. The Air Force designates occupational specialties for about half of each entering cohort. For the remaining recruits, occupations are assigned during basic training and either technical or on-the-job training follows. The length of technical training is known for recruits with designated occupations at enlistment. We assume that recruits not initially assigned will spend time in technical training comparable to those who are assigned, so technical training or its equivalent for nonassigned recruits is assumed to last 19 weeks for men and 17 weeks for women, the mean respective technical training times for occupationally designated recruits. This approximation may overestimate the length of training for undesignated recruits, because they are possibly more likely to be assigned to low skill occupations with shorter than average training times. An indicator variable for the nonassigned recruits was included in the regression models to determine whether their attrition rates in different training phases were higher or lower than those of recruits assigned occupations at the time of enlistment.

### **BASIC TRAINING**

Basic training attrition rates have risen somewhat in the Air Force. Figures 15 and 16 show the trends for recent cohorts. The rates fell about a percentage point for both men and women between FY82 and FY83. Since FY83, the rate has risen 1.5 percentage points for men and 3 points for women.

The composition of basic training attrition has not changed dramatically over time. About half of basic training losses are trainee discharges. The trainee category is a very general class of separation for unsatisfactory performance or conduct during training. Another

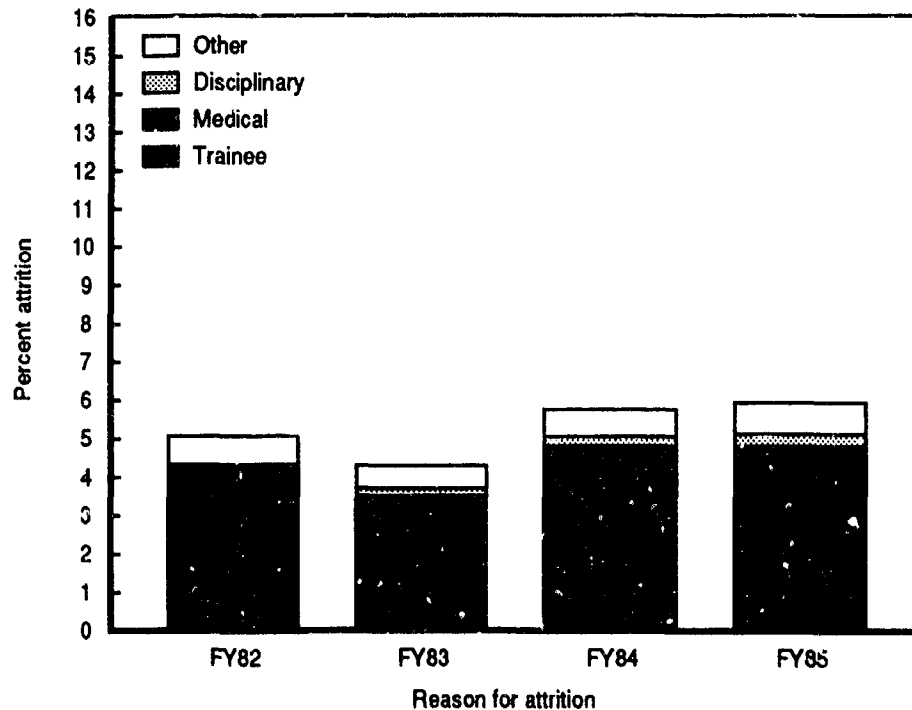


Fig. 15—Trends in basic training attrition: high-quality Air Force men

third of the losses are categorized as medical discharges. Few recruits are discharged for formal disciplinary reasons during basic training in the Air Force. Losses for all other reasons are also small.<sup>1</sup>

### Cohorts

The regression results indicate that the changes in basic attrition rates in recent years do not reflect measured changes in the composition of those entry cohorts. Controlling for other factors, basic training attrition rates for men fell 0.7 percentage point between FY82 and FY83, but then rose 1.6 percentage points by FY85. Since the Air Force trains about 30,000 high-quality men each year, the increase means that about 500 fewer of these recruits graduated from basic training in FY85 than in FY83.

<sup>1</sup>The distribution of reasons for BT losses is similar for the Army and Air Force (see App. C).

Cohort differences for women follow the same pattern as those for men. BT attrition rates were 1 percentage point lower in FY83 than in FY82 and were 2 percentage points higher in FY84 and FY85 than rates in FY82, after controlling for changes in cohort characteristics and occupational assignments.

### Occupation

For men, basic training attrition rates have not varied much with occupational assignment. Combat specialties have loss rates 2.4 percentage points above average. Loss rates in electronic equipment repair and functional support/administration are 1 percentage point below average. Basic training attrition rates of men without occupational designations are not statistically different from the overall average.

The basic training attrition rates of women do not vary much with occupation designation. No occupational group has consistently above

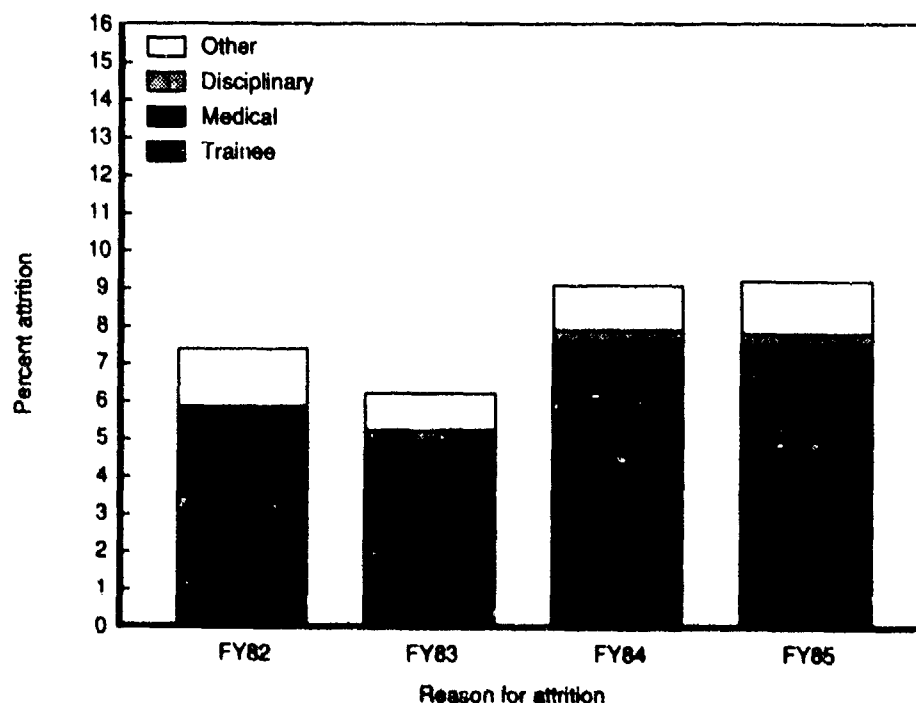


Fig. 16—Trends in basic training attrition: high-quality Air Force women

or below average attrition over the four cohorts. In fact, there are no statistically significant occupation effects in any cohort.

### **Recruit Characteristics**

Individual recruit characteristics affect basic training attrition rates in the Air Force in much the same manner as in other services. For men, loss rates are inversely related to education level and AFQT. Black men have attrition rates about 2 percentage points lower than whites in each cohort. Age has only a weak effect on the attrition rates of Air Force men, but men who are 17 or over 20 years old have slightly above average loss rates.

Fewer individual characteristics significantly affect the basic training attrition rates of women than those of men. Education level and AFQT have little effect on attrition rates. Black women have basic training attrition rates 3.6 percentage points lower than their white counterparts. Women who enlist at age 17 have BT attrition rates about 2.7 percentage points above average.

### **TECHNICAL TRAINING**

For both men and women, the upward trend in basic training attrition rates is partially offset by a downward trend in technical training loss rates. Figures 17 and 18 show that technical training attrition rates have fallen about 1 percentage point between FY82 and FY85. For men, the improvement has been steady and reflects a proportional reduction in attrition in each attrition category. For women, loss rates have gone up and down from cohort to cohort with little change in the composition of reasons for attrition.

### **Cohorts**

The regression results for men indicate that technical training attrition rates changed insignificantly between FY82 and FY83, but that subsequent rates are smaller than those of FY82 after controlling for other changes in the composition of those cohorts. High-quality men in the Air Force had technical training attrition rates 0.5 and 1.0 percentage points lower in FY84 and FY85, respectively, than in FY82.

For women, the apparent cohort differences in technical training attrition rates from Fig. 18 are largely insignificant after controlling for changes in cohort characteristics. The FY83 and FY85 cohorts had rates significantly different from the FY82 cohort, with FY83 and

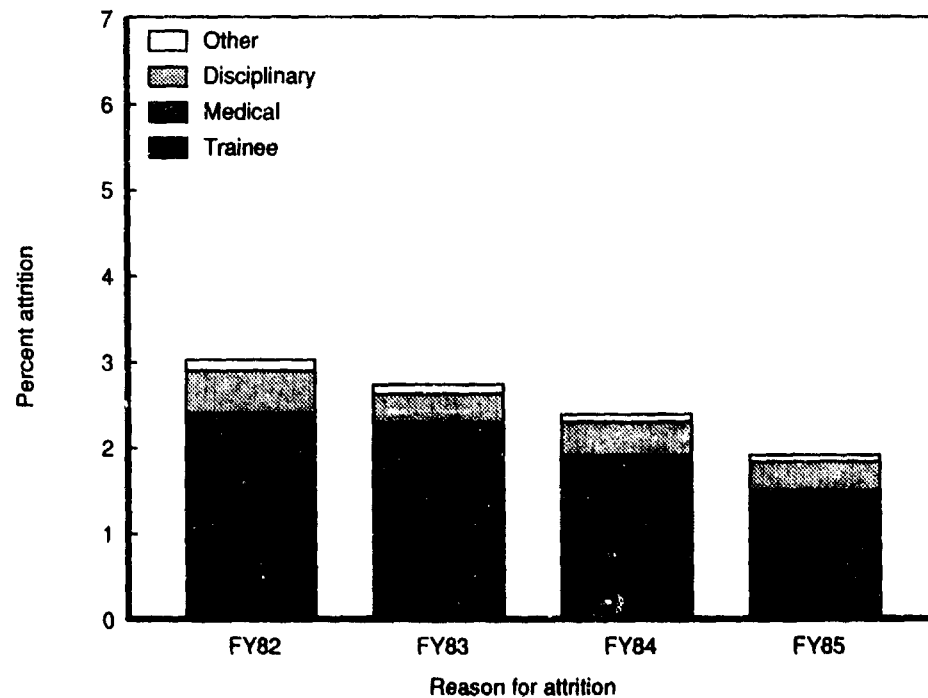


Fig. 17—Trends in technical training attrition:  
high-quality Air Force men

FY85 loss rates estimated at about 0.9 and 0.7 percentage points lower than FY82 rates.

### Training Length and Occupation

As expected, technical training attrition rates are directly related to training time in the recruits' occupational specialty. This relationship reflects the fact that, irrespective of other occupational factors, recruits who train longer are at risk of training attrition for a longer period of time. Recruits without initial occupational assignments have technical training attrition rates 0.4 percentage point lower than the average recruit who is occupationally designated at the time of enlistment.<sup>2</sup>

<sup>2</sup>As discussed above, training time for undesignated recruits is assumed to equal the gender specific training time of occupationally designated recruits. Undesignated recruits have lower attrition rates during this imputed training period than do recruits with comparable known training times. The mean length of technical training for recruits with occupations designated at the time of enlistment is 19 weeks for men and 17 weeks for women.

Occupational differences in technical training attrition are stronger than in BT attrition, but the differences are not persistent across cohorts. Across all four cohorts, men have above average technical training attrition rates in combat and communications/intelligence areas and below average rates in supply/administration and electrical/mechanical repair areas, although none of the effects is significant in each cohort. Women also have above average loss rates in the communications/intelligence and the electrical/mechanical repair areas.

### Recruit Characteristics

Differences in individual characteristics among high-quality Air Force recruits have little effect on their attrition rates. Those factors that do matter are consistent with their effects in other services and in previous research. Technical training attrition does not vary significantly with age for either men or women. Attrition does not significantly differ among black and white men, but black women have attrition rates below those of white women. For men, technical training

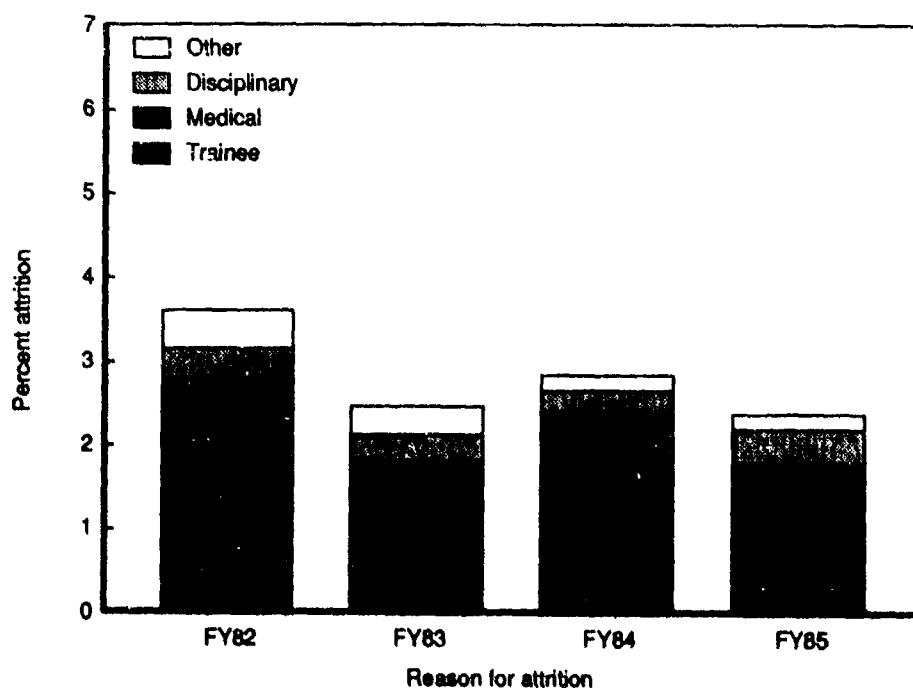


Fig. 18—Trends in technical training attrition:  
high-quality Air Force women

loss rates are below average if the recruit has some post-high school training. AFQT is inversely related to technical training attrition for both men and women.

## **POST-TRAINING**

### **Cohorts**

Post-training attrition rates have differed significantly by cohort for Air Force men but not for women. One-year post-training attrition rates for men were 0.5 percentage point lower in FY83 and FY84 than in FY82. Two-year post-training rates were available only for the FY82 and FY83 cohorts, but the FY83 rate is 1.3 percentage points lower than the FY82 rate.

Cohort differences in post-training attrition rates bear little obvious relationship to basic training attrition rates. Recall that the BT rate fell between FY82 and FY83 before rising above the FY82 rate in FY84 and FY85. Complete post-training information is not available for many cohorts, but so far the attrition rates of the FY83 cohort have been lower than those of the FY82 cohort in the BT, technical training, and post-training phases. While the evidence is limited, it suggests that high training attrition rates do not necessarily reduce post-training rates by culling out high risks. This point is further supported by the finding that the gender-specific basic training attrition rate when the recruit enters BT has no subsequent effect on the post-training attrition rate.

### **Occupation**

Surprisingly, post-training attrition rates do not vary much with occupation for high-quality Air Force men and women. For men, post-training attrition rates are above average in the combat and medical/dental areas and below average in the electronic equipment and electrical/mechanical equipment repair areas. Post-training rates for women are not persistently above or below average in any occupation.

An occupationally related variable does have a significant effect on post-training attrition of men and women. The Delayed Entry Program allows an individual to enlist and wait several months before starting active service. Recruits enter DEP for a variety of reasons, including waiting for a job opening in a desirable occupational specialty. As a result, DEP participation and length may signal well-



matched recruits and subsequently lower attrition. In the regression model, post-training attrition rates of men and women are inversely related to their time in DEP.

### Recruit Characteristics

One surprising result for the Air Force is that black men have post-training attrition rates significantly *higher* than whites. Previous research (see Buddin, 1984 and references therein) has almost invariably shown that minority recruits have lower military attrition than non-minority recruits.<sup>3</sup> Black men in the Air Force have lower BT attrition rates, comparable technical training attrition rates, and higher post-training attrition rates than their white counterparts. Black attrition rates are 0.7 and 2.5 percentage points higher than white rates in the one- and two-year post-training attrition periods, respectively. As in other research, high-quality black women have lower post-training attrition rates than whites.

Post-training attrition rates of Air Force men and women do not vary much with their accession age, much as training rates were invariant to age differences. For men, recruits who were age 21 or older at accession have two-year post-training attrition rates 1.2 percentage points above average.

Men with some post-high school education have lower post-training attrition rates in the Air Force, just as their training rates tended to be below those of high school diploma graduates. For women, the education effects remain weak, with no evidence of post-training attrition rates differing by education level.

AFQT is inversely related to post-training attrition rates for both men and women. The relationship is not persistently significant across cohort for either group, and the magnitude of the relationship is small.

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<sup>3</sup>Because different studies have examined different aspects of attrition, results are not always completely comparable. Some authors have studied six-month attrition whereas others have studied three-year attrition or various training phases. The present study is unusual because it includes only high-quality recruits and separates training and post-training losses.

## **VI. TRENDS IN ATTRITION OF HIGH-QUALITY MARINE CORPS RECRUITS**

Occupational assignment information for the Marine Corps was unavailable, so technical training times could not be assigned as they were for the Army and Air Force. Marine Corps training phases are imputed in the same manner as in Sec. IV on the Navy. Basic training takes place in the first two months of service. Technical training or its equivalent is assumed to occur from months three through six, and post-training after month six. These assumptions about skill training length are obviously not ideal, but they do allow rough comparisons with the other services. Basic training is a well-defined period of general military orientation and physical training in each service. Formal or informal skill training after basic varies considerably across services and by occupation within a service.

### **BASIC TRAINING**

Figures 19 and 20 show the general pattern of Marine Corps basic training attrition for recent cohorts. For men, the rate is virtually constant over the four years, whereas the women's rate has increased about 2 percentage points.<sup>1</sup> The composition of men's and women's losses has changed substantially over time, but the changes probably reflect differences in how attrition is categorized from year to year and not the nature of the losses themselves. For men, the "other" category comprised nearly half of all losses in FY82, but less than 5 percent of losses in subsequent years. This change reflects the fact that so-called erroneous enlistments were responsible for 43 percent of BT losses in FY82 as contrasted with 3 percent of FY83 losses and less than 1 percent of losses in subsequent cohorts. If this improvement truly reflects more careful recruiting practices, then the sharp increase in trainee and medical losses between FY82 and FY83 would merit immediate attention. A more likely scenario is that many losses that are categorized as medical or trainee discharges after FY82 were deemed erroneous enlistments in FY82. Our database does not contain sufficient information to accurately discern whether the changes in attrition

<sup>1</sup>Attrition rates for high-quality men have not changed much since FY82, but the FY82 through FY85 six-month attrition rate was 12.3 percent as compared with 9.4 percent in FY80.

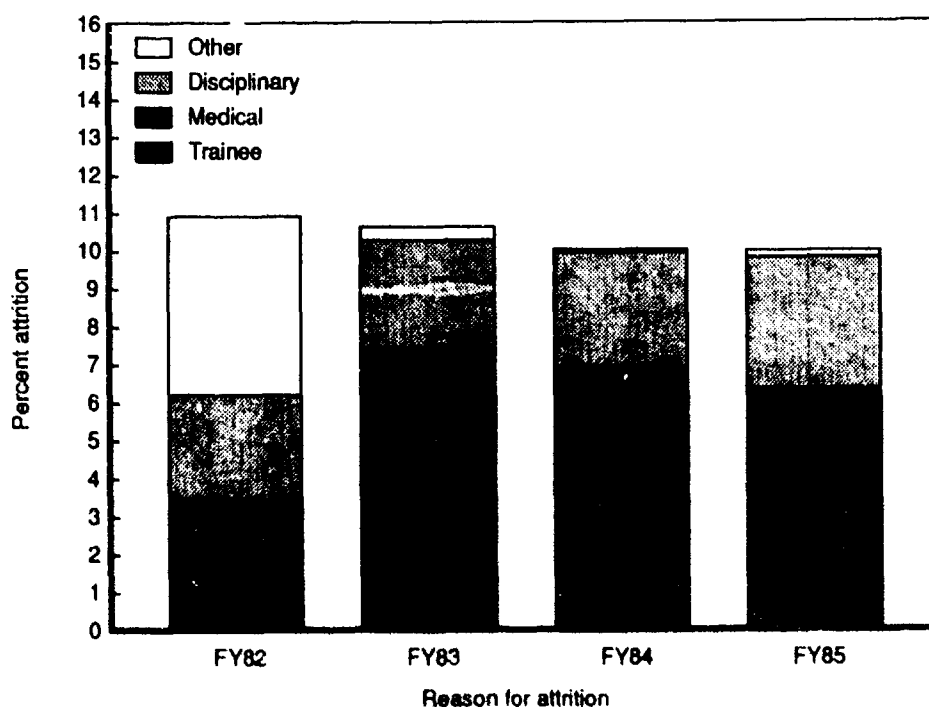


Fig. 19—Trends in basic training attrition:  
high-quality Marine Corps men

composition reflect changes in coding practices or fundamental changes in the nature of attrition losses.

The composition of women's BT attrition has also changed considerably since FY82. The general trainee category has been used for most discharges in each cohort, but the changes in the other categories follow the same pattern as the changes for men. The "other" category becomes small after FY82 because few losses were coded as erroneous enlistments. Medical discharges are almost nonexistent in FY82, but about 2 percent of each subsequent cohort was discharged during basic training for medical reasons.

### Cohorts

After controlling for differences in recruit characteristics and training base assignment, the cohort differences in overall BT attrition rate for men and women become small. For men, loss rates in FY83 and

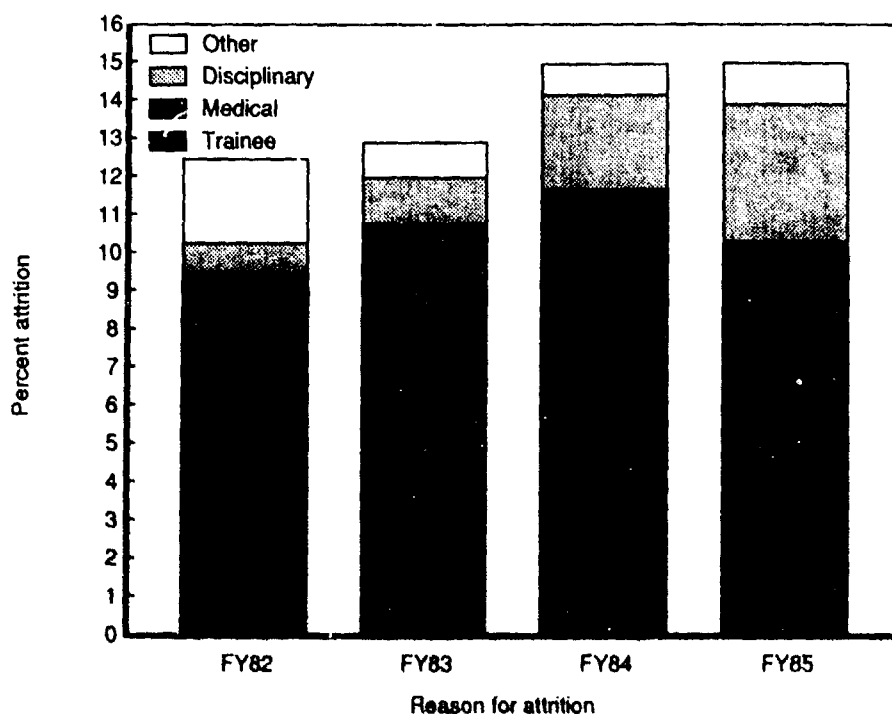


Fig. 20—Trends in basic training attrition:  
high-quality Marine Corps women

FY84 are insignificantly different from those in FY82, while the FY85 cohort rate is 0.9 percentage point lower than that of FY82. Women's BT attrition rates were 2.7 percentage points higher in FY84 than in FY82.

### Training Bases

The Marine Corps trains new recruits at two bases: San Diego and Parris Island. About 48 percent of the men and 97 percent of the women are assigned to basic training at Parris Island, South Carolina. With only two training bases, BT attrition rates at one base can only be above average at one base if they are below average at the other.

BT attrition rates for men differ by training base, but one base has not been persistently better than the other. In FY82, men's rates were 2.7 percentage points below average at Parris Island. In FY83 and FY84, the rates were insignificantly different at the two bases. In

FY85, the loss rate at Parris Island was 2 percentage points above average. In some cohorts, comparable quality recruits are much more or less likely to fail basic training if they are assigned to different bases, and the high risk base depends on entry cohort.

Although few women are assigned to San Diego, women's BT rates do not vary significantly with training base.

### **Recruit Characteristics**

For men, age differences in BT attrition rates are large: 17 year olds have rates 1.3 percentage points below average and recruits who are 21 or older have rates 4.4 percentage points above average. Race differences in attrition rates are generally insignificant, but recruits with some post-high school education are more likely to complete BT. As in the other services, AFQT is inversely related to the BT attrition rate, but a 10 point increase in AFQT is predicted to reduce the likelihood of BT attrition by only 0.6 percentage point.

Differences in measured individual characteristics are not important in explaining women's BT attrition. Age and education differences are insignificant. Black women have statistically lower BT attrition rates than white women when all four cohorts are combined, but race differences are significant only in the FY82 cohort. AFQT has a small negative effect on BT losses, with a 10 point increase in AFQT score predicted to reduce the attrition rate by only 1 percentage point.

### **TECHNICAL TRAINING**

Figure 21 shows that male attrition rates during months three through six (the primary period of on-the-job or formal technical training) have not changed much in recent cohorts. The composition of these losses has been much more stable than the composition of Marine Corps BT attrition. Most discharges are categorized as either trainee or medical losses.

For women, technical training attrition rates shown in Fig. 22 have fallen considerably in recent years with FY85 attrition rates nearly 2 percentage points lower than FY82 and FY83 rates. The improvement reflects a 50-percent reduction in trainee discharges.

### **Cohorts**

The cohort effects in the multivariate model reiterate the raw patterns displayed in Figs. 21 and 22. For men, cohort differences in technical training attrition are insignificant after controlling for recruit

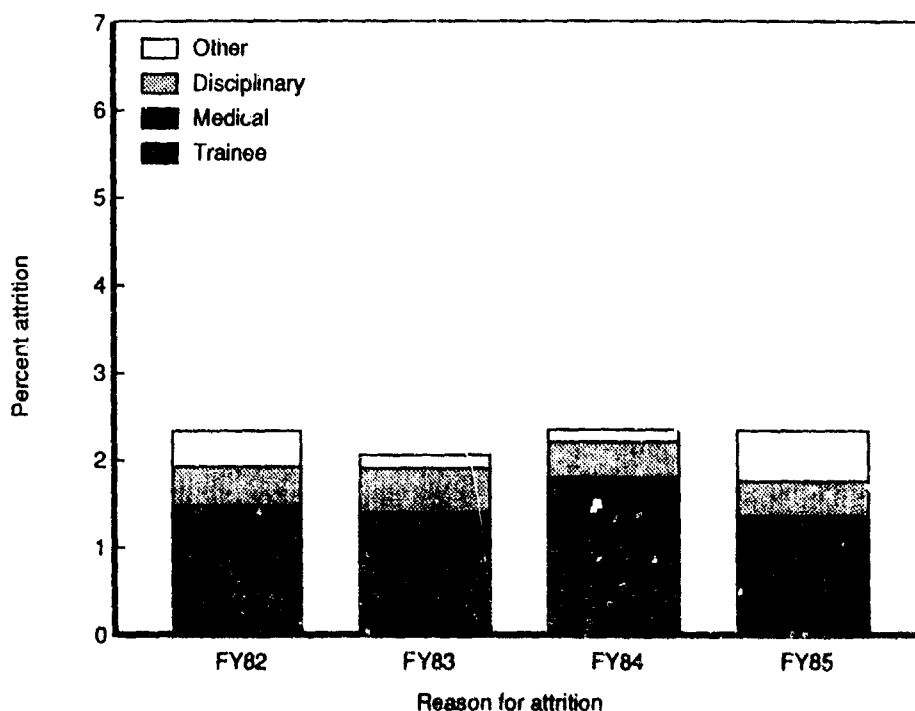


Fig. 21—Trends in technical training attrition:  
high-quality Marine Corps men

characteristics and training base assignment. For women, the FY84 and FY85 technical training attrition rates are 1.3 and 2.0 percentage points lower than the FY82 rate.

#### Basic Training Bases

Do recruits from high BT attrition bases have lower technical training attrition rates? Few women are assigned to San Diego for BT, and BT attrition rates did not vary by base, so it is not surprising that technical training rates for women are unrelated to BT base.

For men, BT rates were 5.4 percentage points higher at San Diego than Parris Island in FY82, but BT survivors were equally likely to complete the technical training period. Similarly, technical training attrition rates did not differ for San Diego and Parris Island BT trainees in FY85, when the BT attrition rates were 4 percentage points lower at San Diego than at Parris Island. When BT attrition rates

were comparable across bases in FY84, San Diego BT graduates had technical training attrition rates 0.8 percentage point lower than Parris Island graduates. Taken as a whole, there is no evidence that high BT attrition rates are made up by lower subsequent technical training attrition rates.

### Recruit Characteristics

Differences in standard individual demographic characteristics have little effect on technical training attrition rates in the Marine Corps. For men, race, education, and AFQT coefficients are all insignificant. Men 21 and older have above average technical training attrition rates just as they had above average BT attrition rates. AFQT is inversely related to technical training attrition for women, but other individual characteristics are insignificant.

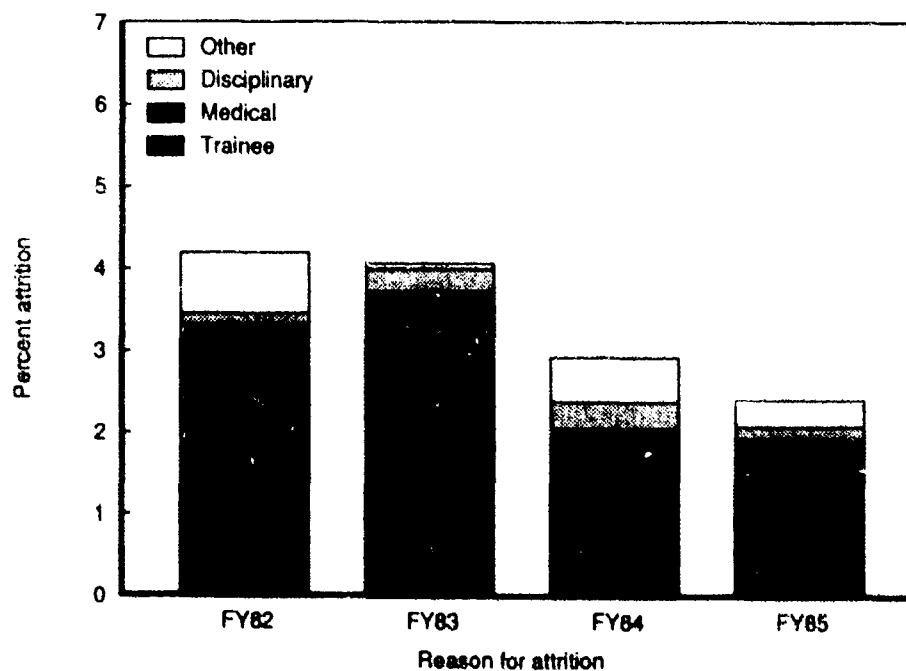


Fig. 22—Trends in technical training attrition:  
high-quality Marine Corps women

## POST-TRAINING

### Cohorts

Men's post-training attrition rates have not varied much by cohort in recent years: the only significant difference is that one-year post-training attrition is 0.4 percentage point higher in FY84 than in FY82. For high-quality Marine Corps men, BT, technical training, and post-training attrition rates have been very stable over time.<sup>2</sup>

For women, there is no significant trend in one-year post-training attrition, but two-year post-training attrition was 2.6 percentage points lower in FY83 than in FY82. Training attrition rates for women did not differ between FY82 and FY83, so the FY83 reduction cannot be ascribed to stricter training policies in FY83 than in FY82.

### Basic Training Bases

Both BT base assignment and BT attrition rate during training have no significant effect on post-training attrition rates of Marine Corps women. For men, BT base assignment does not significantly affect post-training rates, but the BT attrition rate when the recruit entered training is inversely related to his post-training attrition. The size of the relationship is very small—a 1 percentage point increase BT attrition rate implies a 0.8 and 1.4 percentage point reduction in one- and two-year post-training attrition rates, respectively.

### Recruit Characteristics

For men, recruits with one year of college or technical training have one- and two-year post-training attrition rates 1.2 and 2.6 percentage points, respectively, lower than recruits with only a high school diploma. Post-training attrition rates tend to decline with increases in AFQT. As in the other services, DEP length is inversely correlated with post-training attrition rates in each cohort—an indication that young men who plan ahead or wait for preferred job openings are less likely to be ill-suited for the Marine Corps than more impulsive

<sup>2</sup>Six-month attrition rates for high-quality Marine Corps men have been stable since FY82, but the FY82 rate was much higher than the rate in FY80 and FY81. In Sec. II, we saw that the sharp improvement in Marine Corps quality in the early 1980s coincided with a period of sharp increases in six-month attrition rates of high-quality men. Marine Corps training attrition rates for men are now stable at rates higher than most planners would have envisioned in 1982.



recruits who are anxious to start active duty immediately.<sup>3</sup> Other recruit characteristics available in our database (race and accession age) have insignificant effects on post-training attrition of Marine Corps men.

Age, education, AFQT, and DEP variables are all insignificant in the women's post-training attrition regressions. The only significant recruit characteristic is race: one- and two-year post-training attrition rates of black women are 1.9 and 8.9 percentage points, respectively, lower than those of white women.

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<sup>3</sup>Another explanation for lower attrition among DEP participants is that DEP allows the individual recruit time to reassess his enlistment decision before entering active duty. Apprehensive recruits may drop out of DEP and not enter active duty at all. Attrition from DEP is discussed at greater length in Buddin (1984).

## VII. CONCLUSIONS

Our research strongly suggests that different interpretations and enforcement of service attrition policies at different bases may have an effect on attrition rates that has not been ascertained and is not yet fully understood. Previous attrition research has typically focused on how individual characteristics affect attrition rates within a cohort. Those studies predicted that recent improvements in recruit quality should have dramatically reduced attrition rates. But we must conclude from the present study that the patterns of high-quality attrition rates in recent cohorts demonstrate that cohort characteristics alone do not determine attrition rates.

The major finding of this study is that recruits of comparable quality have much different training attrition rates in some cohorts and at some bases in a given cohort. These differences indirectly measure the effects of other, as yet unspecified, factors on attrition rates. It may well be that service attrition policies and practices vary considerably from time to time and from place to place. Thus, while recruit characteristics can be used to rank prospective recruits by relative risk category, the interpretation and enforcement of attrition policies may have a critical effect on determining the actual attrition level.

### ARMY

Army experience demonstrates both how much attrition practices can vary within a service and how attrition management can be used to increase the personnel available. Within a cohort, basic training attrition rates for high-quality men and women have ranged up to 9 and 16 percentage points higher, respectively, at some bases than at others. Across cohorts, the 6-month attrition rate of high-quality men rose from 6.6 percent in FY79 to 10.9 percent in FY83. The new Army attrition program begun in FY85 (December 1984) has demonstrated that attrition management can yield large benefits. With no adjustment in recruit quality or standards, the new Army program resulted in 4 and 6 percent more trained high-quality men and women available, respectively, in FY85 than in FY83. These effects are comparable in magnitude with those of enlistment incentives such as enlistment bonuses and educational benefits. Subsequent research will be needed to assess whether the FY85 cohort in the Army ultimately has higher post-training attrition rates, but our analysis of previous cohorts

indicates very little relationship between basic training attrition rates in a cohort and subsequent post-training attrition rates.

## **NAVY**

The Navy has traditionally had less difficulty attracting high-quality recruits than the Army, but improvements in recruit quality since 1980 have been much smaller than in the Army. Cohort attrition patterns are also weaker in the Navy than in the Army. After controlling for differences in recruit characteristics, the BT attrition rate of high-quality Navy men rose about 1.5 percentage points between FY82 and FY85 on a base BT attrition rate of about 6 percent. Within a cohort, the BT attrition rates of comparable high-quality men at various training bases differ from 2 to 3 percentage points depending on training base assignment. The cohort and training base effects suggest that differences in Navy policies and practices over time and across bases may have an effect on Navy attrition rates for men.

Training base effects could not be estimated for Navy women, because all women train at the same base. Training attrition rates for Navy women have not changed significantly in recent cohorts.

## **AIR FORCE**

High-quality attrition rates in the Air Force also show some upward trend after controlling for differences in cohort characteristics. BT rates, for example, have risen about 2 percentage points for both men and women in recent cohorts. All new Air Force recruits train at the same base, so comparison across sites is not possible.

## **MARINE CORPS**

The Marine Corps, like the Army, has sharply improved recruit quality since 1980. Cohort differences in the attrition rates of high-quality recruits were small for both men and women between FY82 and FY85, but 6-month attrition rates of high-quality men in the FY82 through FY85 cohorts averaged 12.3 percent, compared with 9.4 percent in the FY80 cohort. BT attrition rates for comparable quality men differ 4 or 5 percentage points between training bases as compared with a mean BT attrition rate of 10 percent. These large cohort and base effects are an indication that Marine Corps training attrition practices and policies may vary considerably at different bases and in different years.

## SUMMARY

Why did improvements in recruit quality not reduce attrition rates? How will future changes in cohort characteristics influence attrition rates? Answering questions such as these requires much more information on the demand-side and institutional factors that appear to influence service attrition practices. The Army study uncovered numerous areas for improvement, but it did not directly address the issue of why attrition rates rose when cohort quality rose. Several reasons—essentially reflecting possible practices within the services or at different training bases—are possible:

1. In a strong recruiting environment, replacement personnel are readily available, so the training bases spend less time with problem recruits.
2. The training commands and training bases may essentially grade on a curve rather than against a fixed performance standard, so they expect comparable losses in each cohort, and these expectations are self-fulfilling.
3. When service recruiting policies attract larger proportions of high school graduates in a given cohort, the marginal graduate enlistees may be less well-matched with the military than graduates who would have enlisted under earlier recruiting policies.

Base and cohort effects suggest that attrition practices differ, but without documentation of specific base practices and policies, we are unable to explain why or to predict how they might change in the future. The efficacy of the Army's new attrition program cannot be assessed without a careful recording of what training base arrangements were in effect as each individual recruit passed through the training system. More importantly, accurate attrition forecasts will require information on institutional environment and incentives as well as individual recruit characteristics.

**Appendix A**

**ATTRITION PATTERNS BY ACCESSION COHORT AND QUALITY**

Table A.1  
DEFINITIONS OF REGRESSION VARIABLES

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<i>Entry Cohort</i> <sup>a</sup>	
FY77-FY86	Fiscal year of accession, omitted reference group
<i>Race</i>	
Black	Black
Nonblack	Other races, omitted reference group
<i>Education</i>	
HSDG	High school diploma graduate
NHSDG	Not high school diploma graduate, omitted reference group
<i>Test Category</i>	
Cat 1 and 2	AFQT percentile between 65 and 99, omitted reference group
Cat 3a	AFQT percentile between 50 and 64
Cat 3b	AFQT percentile between 31 and 49
Cat 4	AFQT percentile between 10 and 30
Cat unknown	AFQT percentile missing
<i>Service</i>	
Army	Army accession, omitted reference group
Navy	Navy accession
Air Force	Air Force accession
Marine Corps	Marine Corps accession

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<sup>a</sup>The fiscal year dummy variable group is parameterized so that the coefficients indicate whether the attrition rate in a particular cohort differs from the overall attrition rates. A given indicator variable is coded as 1 if the category occurs, 0 if another included indicator occurs, and -1 times the proportion of observations in the *i*th category divided by the proportion of observations in the reference category if the omitted category occurs (Morris and Rolph, 1978).

Table A.2

LOGISTIC REGRESSION RESULTS FOR 6-MONTH MALE ATTRITION  
OF FY77-FY84 ACCESSIONS BY SERVICE

Variable	All DoD	Army	Navy	Air Force	Marine Corps
Sample size	2813492	1146083	747445	561876	358088
Mean rate	.11380	.12017	.10562	.09489	.14013
FY78	-.08993**	-.08233**	.00637	-.05111**	-.26712**
FY79	-.18876**	-.28497**	.01926+	-.16356**	-.30007**
FY80	-.24231**	-.28748**	-.15983**	-.26378**	-.19643**
FY81	-.08081**	-.07192**	-.24201**	-.02854*	.06043**
FY82	.08477**	.15649**	-.10745**	.06936**	.22125**
FY83	.13096**	.29260**	-.10014**	-.04170**	.15360**
FY84	.08524**	.15135**	-.07294**	.10960**	.11719**
FY85	-.01093+	-.15260**	.06700**	.12268**	.09484**
FY86	.11873**	-.06066**	.24824**	.20083**	.29361**
Black	-.29766**	-.38996**	-.12440**	-.39972**	-.07190**
HSDG	-.66629**	-.65482**	-.67042**	-.90529**	-.69291**
Cat 3a	.19225**	.16946**	.21649**	.23499**	.10368**
Cat 3b	.35260**	.31043**	.37479**	.45369**	.22672**
Cat 4	.59091**	.47409**	.85945**	.59153**	.48296**
Cat unknown	.39854**	.33808**	.18422**	.66747**	.22350**
Navy	-.08476**				
Air Force	-.05381**				
Marine Corps	.25801**				
Intercept	-1.77074**	-1.70976**	-1.95189**	-1.66146**	-1.43070**

+Significant at the  $\alpha = 0.10$  confidence level.\*Significant at the  $\alpha = 0.05$  confidence level.\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table A.3

LOGISTIC REGRESSION RESULTS FOR 36-MONTH MALE ATTRITION  
OF FY77-FY84 ACCESSIONS BY SERVICE

Variable	All DoD	Army	Navy	Air Force	Marine Corps
Sample size	2273204	931239	593298	454024	294643
Mean rate	.28129	.31116	.25487	.24373	.29796
FY78	-.09186**	-.15112**	-.10473**	.11106**	-.19009**
FY79	-.07407**	-.16148**	-.00842	.04313**	-.11875**
FY80	-.01617**	-.05546**	.03195**	-.01518+	-.01086
FY81	.05933**	.04211**	.06548**	.04451**	.15102**
FY82	.07576**	.11679**	.03792**	-.00931	.16963**
FY83	.01478**	.09333**	-.05372**	-.18650**	.07942**
FY84	-.01764**	.03854**	-.08982**	-.15681**	.04120**
Black	-.15753**	-.27819**	-.07486**	-.05784**	.13168**
HSDG	-.96921**	-.98550**	-.96032**	-1.14018**	-.91723**
Cat 3a	.20000**	.21788**	.16675**	.22324**	.16226**
Cat 3b	.31672**	.32828**	.26894**	.37278**	.26973**
Cat 4	.40949**	.40106**	.50522**	.44131**	.44153**
Cat unknown	.12799**	.27217**	.03318	.06771**	.16964**
Navy	-.17936**				
Air Force	-.05208**				
Marine Corps	.04890**				
Intercept	-.36946**	-.32200**	-.56704**	-.31647**	-.39713**

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table A.4

LOGISTIC REGRESSION RESULTS FOR 6-MONTH FEMALE ATTRITION  
OF FY77-FY86 ACCESSIONS BY SERVICE

Variable	All DoD	Army	Navy	Air Force	Marine Corps
Sample size	381243	168443	84216	108091	20493
Mean rate	.14310	.17033	.10817	.12346	.16644
FY78	-.16585**	-.28758**	.15819**	-.15603**	-.20467**
FY79	-.12373**	-.21376**	-.02469	-.07750**	.05898
FY80	-.12315**	-.06368**	-.26152**	-.12757**	-.07032
FY81	.00339	.17480**	-.30295**	-.03259	-.30148**
FY82	.11552**	.22395**	-.00142	.02509	.02551
FY83	.17870**	.33184**	.09274**	-.13517**	.01000
FY84	.17725**	.25839**	-.03357	.14890**	.16236**
FY85	.02399+	-.04064+	.11704**	.15387**	.03559
FY86	.09676**	-.10288**	.31264**	.27215**	.17972**
Black	-.59332**	-.69615**	-.27716**	-.60192**	-.27779**
HSDG	-.68525**	-.62938**	-.50482**	-.85392**	-.69573**
Cat 3a	.19816**	.21469**	.21336**	.15214**	.22020**
Cat 3b	.32380**	.30531**	.41078**	.31649**	.26339**
Cat 4	.45185**	.43096**	.63410**	.28254**	.07746
Cat unknown	.16338**	.22661**	.01356	.19084**	-.36817*
Navy	-.61297**				
Air Force	-.44274**				
Marine Corps	.01029				
Intercept	-.98316**	-1.01514**	-1.85983**	-1.25957**	-1.00471**

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.



Table A.5

LOGISTIC REGRESSION RESULTS FOR 36-MONTH FEMALE ATTRITION  
OF FY77-FY84 ACCESSIONS BY SERVICE

Variable	All DoD	Army	Navy	Air Force	Marine Corps
Sample size	302467	137749	63394	85088	16236
Mean rate	.35649	.41740	.27067	.30597	.43957
FY78	-.00716	-.03678*	-.00962	-.00232	.17096**
FY79	-.01332	-.02521+	-.01680	.00440	.07242+
FY80	.01854*	.06753**	-.05479**	.01658	-.01659
FY81	.01794+	.07995**	-.05900**	.00924	-.10548**
FY82	.00222	.00353	.06847**	-.04677*	-.04331
FY83	-.01582	.00049	.04897*	-.10301**	-.14935**
FY84	-.03336**	-.03493*	-.02651	-.05938**	-.04099
Black	-.69347**	-.76992**	-.52332**	-.60582**	-.56376**
HSDG	-.71839**	-.63918**	-.59425**	-.85767**	-.63205**
Cat 3a	.17871**	.19824**	.20218**	.15077**	.13920**
Cat 3b	.27147**	.26304**	.32951**	.26446**	.19595**
Cat 4	.33322**	.34304**	.40282**	.19516**	-.09207
Cat unknown	-.10296**	.16829**	.03420	-.32904**	-.21453+
Navy	-.78282**				
Air Force	-.59872**				
Marine Corps	.09169**				
Intercept	.37915**	.31845**	-.56755**	-.08099**	.39197**

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

## Appendix B

### ATTRITION TRENDS FOR HIGH-QUALITY ACCESSIONS

Table B.1

#### DEFINITIONS OF REGRESSION VARIABLES

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<i>Entry Cohort</i>	
COHORT82	FY82 accession, omitted reference group
COHORT83	FY83 accession
COHORT84	FY84 accession
COHORT85	FY85 accession
<i>Age at Accession<sup>a</sup></i>	
AGE17	17-year-old accession
AGE18	18-year-old accession, omitted reference group
AGE19	19-year-old accession
AGE20	20-year-old accession
AGE21	Accession age greater than 20
<i>Race</i>	
BLACK	Black
WHITE	White, omitted reference group
<i>Education Level</i>	
HSDG	High school diploma graduate, omitted reference group
COLL1	One year of college or technical training
COLL2	Two years of college or technical training
COLL34	Three or four years of college or technical training
COLLGRAD	College graduate
AFQT	Armed Forces Qualification Test Percentile
AIT Training TRTIME0	Valid only for Air Force; indicates recruit did not have designated occupation at accession or the designated occupation required no technical training

TRTIME1

Length of advanced individual or technical training in occupational specialty; valid only in Army and Air Force

*Basic Training Bases<sup>a</sup>*

## Army:

BENNING

Trained at Ft. Benning, Georgia

BLISS

Trained at Ft. Bliss, Texas

DIX

Trained at Ft. Dix, New Jersey

JACKSON

Trained at Ft. Jackson, South Carolina

KNOX

Trained at Ft. Knox, Kentucky

LNUW

Trained at Ft. Leonard Wood, Missouri

MCLN

Trained at Ft. McClellan, Alabama

SILL

Trained at Ft. Sill, Oklahoma

## Navy:

GTLAKES

Trained at Great Lakes, Illinois

ORLANDO

Trained at Orlando, Florida

SAN DIEGO

Trained at San Diego, California

## Air Force:

LACKLAND

Trained at Lackland, Texas

## Marine Corps:

PARRIS ISLAND

Trained at Parris Island, South Carolina

SAN DIEGO

Trained at San Diego, California

DPMS

Months in Delayed Entry Program

OSUT

One-station-unit-training program, valid only for Army

*DoD Occupation Area<sup>a</sup>*

OCC0

Infantry, gun crews, and seamanship specialists

OCC1

Electronic equipment repairers

OCC2

Communications and intelligence specialists

OCC3

Medical and dental specialists

OCC4

Other technical and allied specialists

OCC5

Functional support and administration

OCC6

Electrical/mechanical equipment repairers

OCC7

Craftsmen

OCC8

Service and supply handlers

OCC9

Non-occupational

*Physical Condition*

BODYMASS

Recruit bodymass at accession. For men, bodymass is defined as weight (in kilograms) divided by height squared (in meters). For women, bodymass is defined as weight (in kilograms) divided by height (in meters) to the 1.5 power.

BODYMAS2

BODYMASS squared

*BTRATE*

Gender and basic training base specific  
basic training attrition rate when the  
recruit entered basic training

---

<sup>a</sup>This dummy variable group is parameterized so that the coefficients indicate whether the attrition rate in a particular category differs from the overall attrition rate. A given indicator variable is coded as 1 if the category occurs, 0 if another included indicator occurs, and -1 times the proportion of observations in the *i*th category divided by the proportion of observations in the reference category if the omitted category occurs (Morris and Rolph, 1978).

Table B.2

LOGISTIC REGRESSION RESULTS FOR BASIC TRAINING  
ATTRITION OF HIGH-QUALITY ARMY MEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	5.34220**	6.44027**	5.32205**	5.72462**	2.81446**
COHORT83	0.21280**				
COHORT84	-0.02196				
COHORT85	-0.35229**				
AGE17	-0.05062	0.00308	0.01935	-0.18982*	-0.04434
AGE19	-0.04841*	-0.04983	-0.10748**	0.00831	-0.03200
AGE20	-0.05753+	-0.09964	-0.05344	-0.01956	-0.03667
AGE21	0.21870**	0.21869**	0.18263**	0.33661**	0.15620**
BLACK	-0.34330**	-0.41172**	-0.27953**	-0.41434**	-0.22515*
COLL1	-0.22371**	-0.15079	-0.23328**	-0.32061**	-0.16072
COLL2	-0.24056**	-0.18234	-0.19068*	-0.43914**	-0.14118
COLL34	-0.42942**	-0.29551	-0.34962*	-0.74716**	-0.27537
COLLGRAD	-0.21425**	-0.31064*	-0.02103	-0.28960*	-0.42151**
AFQTP	-0.00795**	-0.00589**	-0.00788**	-0.00922**	-0.00936**
TRTIME1	-0.00410**	-0.00330	-0.00674*	-0.00353	-0.00136
BENNING	0.02990	0.09797	0.06649	0.05970	0.01827
BLISS	-0.34592**	-0.36670**	-0.50962**	-0.35968**	0.01853
DIX	-0.05254+	-0.01101	0.00504	-0.28851**	0.00032
KNOX	0.03554	0.10433	-0.01763	-0.08853	0.43492**
LNWD	0.00724	0.05486	0.07346	-0.08553+	-0.20824**
MCLN	-0.52598**	-0.29360**	-0.53306**	-0.63608**	-0.61618**
SILL	-0.25259**	-0.28573**	-0.38505**	-0.09542	-0.21343*
DPMS	-0.00726+	0.01199	-0.00260	-0.01963**	-0.01048
OSUT	-0.12090*	0.07251	-0.23827**	-0.22549*	0.09994
OCC1	-0.16642**	-0.17458*	-0.05582	-0.22538**	-0.16516
OCC2	0.02678	0.10906*	-0.04911	0.02186	0.01230
OCC3	0.02538	0.04555	-0.00601	-0.11919	0.24016
OCC4	-0.05148	0.08090	-0.01114	-0.12558	-0.39145
OCC5	0.01949	0.06336	-0.03435	0.06582	0.11974
OCC6	-0.13583**	-0.14403*	-0.09457+	-0.13120*	-0.06979
OCC7	-0.06146	0.21060	0.05980	-0.16493	-0.27847
OCC8	0.29711**	0.48555**	0.18671**	0.28807**	0.36753**
RODYMSS	-0.69270**	-0.80791**	-0.67563**	-0.72125**	-0.47458**
BODYMAS2	0.01566**	0.01809**	0.01542**	0.01645**	0.01045**
MEAN RATE	0.060	0.061	0.072	0.059	0.042
SAMPLE SIZE	158580	36150	46462	48299	27669

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.3

LOGISTIC REGRESSION RESULTS FOR ADVANCED INDIVIDUAL TRAINING  
ATTRITION OF HIGH-QUALITY ARMY MEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	2.56820**	2.40740**	2.91929**	4.10474**	-0.97144+
COHORT83	-0.12911*				
COHORT84	-0.23277**				
COHORT85	-0.53756**				
AGE17	-0.06181	0.02159	0.15510	-0.27024+	-0.32217
AGE19	-0.09292*	-0.19730**	-0.06729	-0.02971	-0.04374
AGE20	-0.07142	-0.14267	-0.09737	0.01876	-0.02298
AGE21	0.24180**	0.40816**	0.13835*	0.24933**	0.14175+
BLACK	-0.25747**	-0.31529**	-0.17241	-0.32214**	-0.20031
COLL1	-0.42226**	-0.47157**	-0.45743**	-0.51096**	-0.08238
COLL2	-0.35975**	-0.54756**	-0.30738+	-0.31564+	-0.26929
COLL34	-0.66595**	-0.64562*	-0.80734**	-0.64223*	-0.42357
COLLGRAD	-0.35826**	-0.17768	-0.51679**	-0.30963	-0.37146
AFQTP	-0.00785**	-0.01074**	-0.00435+	-0.00918**	-0.00645
TRTIME1	0.04911**	0.03562**	0.05976**	0.08383**	0.01278*
BENNING	0.44686**	0.29010*	0.52790**	0.60244**	0.79135**
BLISS	-0.13335	-0.40544*	-0.22547	-0.13822	-0.02684
DIX	-0.12172*	-0.27808**	0.00125	-0.38409**	0.04198
KNOX	-0.24612**	-0.32177**	-0.32391**	-0.11458	0.02292
LNWD	-0.42256**	-0.41348**	-0.54317**	-0.20278*	-0.73191**
MCLN	0.59276**	1.19503**	0.41678**	-0.02219	0.38720+
SILL	-0.22590**	-0.34296**	-0.18783	0.05718	-0.82288**
DPMS	-0.03382**	-0.02150	-0.04745**	-0.02537*	-0.04944*
OSUT	-0.29096**	-0.42262**	-0.18648	-0.04973	-0.48556+
OCC1	0.04890	0.27210*	-0.47415**	0.13670	0.22472
OCC2	0.01738	-0.02066	-0.02755	0.07505	0.05544
OCC3	-0.19717*	-0.21747	-0.12683	-0.14653	-0.48269+
OCC4	-0.17708	-0.65470**	-0.19406	-0.08940	0.91080*
OCC5	0.10512	-0.10367	0.27720*	0.08385	0.22892
OCC6	-0.07730	-0.15709	-0.02844	0.11683	-0.09013
OCC7	0.07554	-0.39674	0.15719	0.41431	0.11093
OCC8	0.22148**	0.50856**	0.37087**	0.02267	-0.09224
BODYMASS	-0.58605**	-0.53476**	-0.65470**	-0.76523**	-0.24701
BODYMAS2	0.01339**	0.01228**	0.01526**	0.01704**	0.00573
BTRATE	2.39012**	-0.95935	-0.97148	1.59738	-3.81785
MEAN RATE	0.021	0.026	0.023	0.019	0.014
SAMPLE SIZE	148586	33931	43101	45454	26500

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.4

LOGISTIC REGRESSION RESULTS FOR ONE-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY ARMY MEN BY COHORT

Variable	Accession Cohort			
	FY82-FY84	FY82	FY83	FY84
INTERCEP	-0.00218**	-0.68459**	0.19771**	0.20678**
COHORT83	-0.07334*			
COHORT84	-0.08772*			
AGE17	-0.19901**	-0.18561+	-0.29829**	-0.08999
AGE19	-0.11266**	-0.15578**	-0.08743+	-0.10675*
AGE20	-0.05705	-0.03801	-0.03934	-0.09988
AGE21	0.33556**	0.39223**	0.29514**	0.30468**
BLACK	-0.12262*	-0.09087	-0.12054	-0.14445+
COLL1	-0.44550**	-0.52590**	-0.48794**	-0.34282**
COLL2	-0.55510**	-0.66248**	-0.41996**	-0.57749**
COLL34	-0.56831**	-0.71687**	-0.45384*	-0.51699**
COLLGRAD	-0.38667**	-0.43453**	-0.28137*	-0.41923**
AFQTP	-0.00688**	-0.00675**	-0.00654**	-0.00737**
TRTIME1	-0.01790**	-0.01779**	-0.01633**	-0.01814**
BENNING	0.13940**	0.00335	0.16048+	0.24612**
BLISS	-0.09615	-0.16177	0.07045	-0.17654+
DIX	-0.03186	-0.00355	-0.00013	-0.00757
KNOX	0.05626	0.17711*	0.05573	-0.00390
LNWD	-0.14406**	-0.13300*	-0.11210+	-0.13167*
MCLN	-0.22275**	-0.17024+	-0.37186**	-0.09060
SILL	0.11083*	0.02519	0.01328	0.25182**
DPMS	-0.03682**	-0.03846**	-0.03330**	-0.03479**
OSUT	0.20213**	0.21934+	0.40443**	-0.00902
OCC1	0.05015	-0.06890	0.04544	0.13481
OCC2	0.08206**	0.07167	0.04812	0.08593
OCC3	0.00947	-0.04870	-0.10342	0.18545+
OCC4	-0.21351*	-0.32695*	-0.29209+	-0.06803
OCC5	0.14240**	0.27746**	0.16484*	-0.01025
OCC6	-0.15354**	-0.10536	-0.08678	-0.26054**
OCC7	-0.03633	-0.14252	-0.08444	0.02323
OCC8	-0.07100	-0.07160	0.07325	-0.19341*
BODYMASS	-0.17381**	-0.10377	-0.20331*	-0.20624*
BODYMAS2	0.00368**	0.00224	0.00435*	0.00429*
BTRATE	-5.08154**	-7.81528**	-6.16248**	-1.05149
MEAN RATE	0.042	0.046	0.039	0.042
SAMPLE SIZE	130911	36150	46462	48299

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.5

LOGISTIC REGRESSION RESULTS FOR TWO-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY ARMY MEN BY COHORT

Variable	Accession Cohort		
	FY82-FY83	FY82	FY83
INTERCEP	1.44399**	0.81968**	1.93235**
COHORT83	-0.05391*		
AGE17	-0.00139	0.05165	-0.05348
AGE19	-0.06499**	-0.07399*	-0.05624
AGE20	-0.01197	0.02285	-0.04398
AGE21	0.15949**	0.16853**	0.14683**
BLACK	-0.02709	-0.03584	-0.01746
COLL1	-0.41961**	-0.40004**	-0.43072**
COLL2	-0.47750**	-0.52720**	-0.43328**
COLL34	-0.45434**	-0.62372**	-0.28855*
COLLGRAD	-0.30936**	-0.21482*	-0.37502**
AFQTP	-0.00616**	-0.00515**	-0.00702**
TRTIME1	-0.01340**	-0.01454**	-0.01219**
BENNING	0.10239*	0.09540	0.08249
BLISS	0.01061	-0.00734	0.05216
DIX	0.01698	0.01361	0.02464
KNOX	0.07448*	0.02010	0.13045**
LNWD	-0.05802+	-0.06188	-0.04581
MCLN	-0.27257**	-0.22238**	-0.28934**
SILL	0.16945**	0.15839**	0.18471**
DPMS	-0.04480**	-0.04855**	-0.04193**
OSUT	0.22069**	0.19756*	0.24227**
OCC1	-0.02698	-0.09767	0.04666
OCC2	-0.05324*	-0.06311+	-0.05264
OCC3	-0.00722	0.02434	-0.03820
OCC4	-0.10961	-0.04262	-0.16823+
OCC5	-0.05165	0.01945	-0.10253+
OCC6	-0.01632	0.00892	-0.03524
OCC7	0.00425	0.12585	-0.07091
OCC8	0.05293	-0.00116	0.09589
BODYMASS	-0.23253**	-0.17769**	-0.28101**
BODYMAS2	0.00485**	0.00374**	0.00585**
BTRATE	-2.94725**	-4.26539**	-2.04382*
MEAN RATE	0.101	0.108	0.096
SAMPLE SIZE	82612	36150	46462

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.



Table B.6

LOGISTIC REGRESSION RESULTS FOR BASIC TRAINING  
ATTRITION OF HIGH-QUALITY ARMY WOMEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	5.77301**	7.26224**	1.81081+	9.54928**	1.97044
COHORT83	0.20669**				
COHORT84	0.19717**				
COHORT85	-0.26406**				
AGE17	-0.17743*	0.08124	-0.25454*	-0.33437**	0.09399
AGE19	-0.14052**	-0.19934*	-0.22923**	-0.07004	0.00574
AGE20	-0.03611	-0.05774	-0.07811	-0.02122	0.07949
AGE21	0.20375**	0.19814**	0.24845**	0.24417**	0.03569
BLACK	-0.65129**	-0.49544**	-0.74331**	-0.65174**	-0.67635**
COLL1	-0.23319**	-0.24312+	-0.17970	-0.34746**	-0.03986
COLL2	-0.31997**	-0.06914	-0.18473	-0.59873**	-0.35970+
COLL34	-0.31669*	-0.47796+	-0.44310+	-0.41260+	0.29266
COLLGRAD	-0.40308**	-0.39551*	-0.41886**	-0.40640**	-0.35259
AFQTP	-0.00897**	-0.00690*	-0.01094**	-0.00741**	-0.01043**
TRTIME1	-0.00567**	-0.00346	-0.00644*	-0.00773*	0.00186
DIX	-0.18594**	-0.07259	-0.17833**	-0.36014**	-0.10013
LNWD	-0.03152	-0.23588*			
MCLN	-0.37999**	-0.00326	-0.59848**	-0.62684**	-0.30601**
DPMS	-0.02637**	-0.01455	-0.01903	-0.02911*	-0.01992
OSUT	-0.78017	-2.61286	-1.25028	1.87431	-0.67907
OCC1	0.07337	0.03282	0.46761**	-0.07648	-0.07627
OCC2	-0.02363	-0.01112	-0.14662**	-0.06602	-0.05594
OCC3	-0.13068**	-0.27005**	-0.13469+	-0.10638+	-0.08363
OCC4	-0.50363**	-0.69758**	-0.48451*	-0.34561+	-0.87439*
OCC5	0.00713	0.08179	-0.00528	-0.04954	0.16649+
OCC6	0.02006	0.09731	0.08678	0.12399	-0.10245
OCC7	0.03561	0.58511	0.29451	-0.30131	-0.29470
OCC8	0.19171**	0.23778*	0.24345**	0.24707**	0.13979
BODYMASS	-0.50763**	-0.64437**	-0.20366	-0.77610**	-0.18927
BODYMAS2	0.00921**	0.01187**	0.00385	0.01412**	0.00225
MEAN RATE	0.120	0.112	0.133	0.131	0.084
SAMPLE SIZE	34177	7765	10420	10418	5574

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.7

LOGISTIC REGRESSION RESULTS FOR ADVANCED INDIVIDUAL TRAINING  
ATTRITION OF HIGH-QUALITY ARMY WOMEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	4.71802**	9.42360**	3.38749+	-4.20860	10.84071
COHORT83	0.01152				
COHORT84	-0.20212**				
COHORT85	-0.48249**				
AGE17	-0.24102*	-0.27940	-0.34858+	-0.20586	0.17516
AGE19	-0.09759+	-0.11055	-0.14037	0.04236	-0.20232
AGE20	-0.02225	-0.00724	0.03353	0.07177	-0.28360
AGE21	0.15854**	0.12651+	0.28425**	0.06999	0.07865
BLACK	-0.57059**	-0.42265**	-0.61999**	-0.56470**	-0.77754**
COLL1	-0.26052**	-0.20198	-0.06063	-0.37239+	-0.44859+
COLL2	-0.33111**	-0.18859	-0.47120*	-0.47642*	0.07624
COLL34	-0.29812	-0.53261	-0.12164	-0.19230	-0.39228
COLLGRAD	-0.54143**	-0.26694	-0.60992**	-0.29502	-1.11037**
AFQTP	-0.00426*	-0.00286	-0.00438	-0.00477	-0.00296
TRTIME1	0.05085**	0.04571**	0.06412**	0.04965**	0.02792**
DIX	-0.19396**	-0.17913*	-0.45363**	-0.28366**	0.02362
LNWD	-0.21530	-0.39197*			
MCLN	0.00795	0.40918**	-0.55632**	0.15795	-0.26848
DPMS	-0.05802**	-0.05325**	-0.08113**	-0.02263	-0.07379*
OSUT	-1.15684	-1.23943	0.28638	-0.14971	-0.00680
OCC1	0.41292**	0.58287**	-0.18208	1.43948**	0.16641
OCC2	0.03096	0.01267	-0.21482*	-0.05349	-0.09519
OCC3	-0.36745**	-0.44130**	-0.30857**	-0.49340**	-0.61435**
OCC4	-0.16107	-0.84975**	-0.03402	-0.35955	1.07817*
OCC5	-0.06194+	-0.00942	-0.01142	-0.14608	-0.11362
OCC6	0.20128**	0.20506	0.34650*	0.59294**	0.26501
OCC7	0.58960	-0.29552	2.86781**	-0.33068	1.66448+
OCC8	0.24721**	0.39104**	0.56496**	0.02635	0.43475*
BODYMASS	-0.56129**	-0.88351**	-0.39381	0.04469	-1.04179
BODYMAS2	0.01037**	0.01600**	0.00697	-0.00033	0.01941
BTRATE	-0.89074	-3.53638*	-6.85994**	-0.43278	-0.25527
MEAN RATE	0.055	0.069	0.060	0.048	0.041
SAMPLE SIZE	30090	6894	9038	9053	5105

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.8

LOGISTIC REGRESSION RESULTS FOR ONE-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY ARMY WOMEN BY COHORT

Variable	Accession Cohort			
	FY82-FY84	FY82	FY83	FY84
INTERCEP	-1.62301	-3.92940	0.96180	-3.44262
COHORT83	-0.03418			
COHORT84	-0.08737			
AGE17	-0.03789	-0.26149	0.30019+	-0.15547
AGE19	-0.00592	-0.00408	-0.11106	0.08353
AGE20	0.07414	0.08686	0.03379	0.10512
AGE21	0.06638+	0.02867	0.10437+	0.05807
BLACK	-0.56723**	-0.68842**	-0.58221**	-0.47964**
COLL1	-0.13758	-0.05665	-0.16198	-0.17580
COLL2	-0.31868**	-0.01473	-0.64216**	-0.21020
COLL34	-0.42826*	-0.04806	-0.51817+	-0.65483*
COLLGRAD	-0.44501**	-0.40076+	-0.68104**	-0.22225
AFQTP	-0.00754**	-0.00984**	-0.00871**	-0.00443
TRTIME1	-0.02278**	-0.02286**	-0.01909**	-0.02527**
DIJX	0.00031	-0.03616	0.01924	0.09013
LNWD	0.04695	-0.02687		
MCLN	-0.02659	-0.07043	0.07330	-0.02078
DPMS	-0.03709**	-0.06126**	-0.03239*	-0.02450+
OSUT	-1.18513	-0.79081	-1.26226	-1.39671
OCC1	0.14845	0.14626	-0.05915	0.27146
OCC2	0.12607**	0.06361	0.03973	0.28690**
OCC3	-0.10447*	0.05450	-0.21590*	-0.18613*
OCC4	0.04138	-0.41796	0.41503	0.09100
OCC5	-0.12084**	-0.22175**	0.05586	-0.23649**
OCC6	0.13873*	0.32639+	0.05128	0.14080
OCC7	0.16310	0.87298	-0.21841	-0.28614
OCC8	-0.00070	0.02991	-0.10869	0.05686
BODYMASS	0.06242	0.27549	-0.15268	0.17531
BODYMAS2	-0.00161	-0.00561	0.00262	-0.00394
BTRATE	-2.43872**	-5.11137**	-1.48445	-1.26400
MEAN RATE	0.074	0.076	0.074	0.072
SAMPLE SIZE	28603	7765	10420	10418

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.9

LOGISTIC REGRESSION RESULTS FOR TWO-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY ARMY WOMEN BY COHORT

Variable	Accession Cohort		
	FY82-FY83	FY82	FY83
INTERCEPT	-1.13197	-4.14604	1.30658+
COHORT83	-0.02820		
AGE17	0.08072	-0.00554	0.15322
AGE19	0.09164+	0.10059	0.08412
AGE20	-0.00505	0.01774	-0.02628
AGE21	-0.03902	-0.04757	-0.03076
BLACK	-0.51525**	-0.63984**	-0.42654**
COLL1	-0.07485	-0.03729	-0.10343
COLL2	-0.25865**	-0.25140+	-0.26458*
COLL34	-0.30262*	-0.15233	-0.42344*
COLLGRAD	-0.36471**	-0.29351*	-0.42012**
AFQTP	-0.00603**	-0.00617**	-0.00583**
TRTIME1	-0.01623**	-0.01755**	-0.01465**
DIX	0.00182	-0.03455	0.05664
LNWD	-0.01478	-0.02489	
MCLN	0.04836	0.05177	0.08227
DPMS	-0.04686**	-0.05384**	-0.03936**
OSUT	-0.28546	0.32723	-1.36947
OCC1	0.06903	0.00791	0.11451
OCC2	0.08558*	0.09863+	0.07303
OCC3	-0.05073	-0.07289	-0.05290
OCC4	0.12400	-0.11396	0.33984+
OCC5	-0.14040**	-0.18238**	-0.10019*
OCC6	0.19863**	0.37141**	0.12481
OCC7	0.05133	0.11545	-0.08781
OCC8	-0.00211	0.06503	-0.08296
BODYMASS	0.06297	0.29841	-0.13221
BODYMAS2	-0.00126	-0.00561	0.00236
BTRATE	-2.32438**	-3.10606**	-1.67092+
MEAN RATE	0.173	0.177	0.170
SAMPLE SIZE	18185	7765	10420

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.10

LOGISTIC REGRESSION RESULTS FOR BASIC TRAINING  
ATTRITION OF HIGH-QUALITY NAVY MEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	1.49468**	3.75572**	1.41435**	-0.14534**	3.12810**
COHORT83	0.15690**				
COHORT84	0.21608**				
COHORT85	0.31358**				
AGE17	-0.20110**	-0.31450**	-0.11500	-0.25563*	-0.15034
AGE19	-0.06216*	-0.07772	-0.02722	-0.07319	-0.06564
AGE20	-0.00010	0.01130	-0.04581	0.07872	-0.04916
AGE21	0.27107**	0.39601**	0.28123**	0.24341**	0.19869**
BLACK	-0.11482*	-0.17683	-0.18721+	-0.02068	-0.11030
COLL1	-0.30064**	-0.33346*	-0.16839	-0.39487**	-0.31884*
COLL2	-0.23890**	-0.20405	-0.26029*	-0.18759	-0.29767*
COLL34	-0.39303**	-0.02742	-0.56269**	-0.35174+	-0.54143*
COLLGRAD	-0.19893*	-0.23611	-0.28164	0.06874	-0.39550*
AFQTP	-0.00957**	-0.01115**	-0.00694**	-0.00862**	-0.01317**
ORLANDO	0.01738	-0.18498**	0.12165**	-0.02580	0.15240**
GTLAKES	-0.15082**	-0.04604	-0.24313**	-0.03789	-0.31243**
DPMS	-0.02459**	-0.01640	-0.02739**	-0.02220**	-0.02856**
BODYMASS	-0.32702**	-0.52239**	-0.33395**	-0.18106*	-0.39069**
BODYMAS2	0.00737**	0.01143**	0.00782**	0.00432*	0.00831**
MEAN RATE	0.059	0.052	0.058	0.061	0.068
SAMPLE SIZE	105289	24646	29351	31183	20109

+Significant at the  $\alpha = 0.10$  confidence level.\*Significant at the  $\alpha = 0.05$  confidence level.\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.11

LOGISTIC REGRESSION RESULTS FOR TECHNICAL TRAINING  
ATTRITION OF HIGH-QUALITY NAVY MEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	-1.27948**	-4.46572	-2.59589	2.22015**	0.05588+
COHORT83	0.22586**				
COHORT84	0.16519*				
COHORT85	0.27947**				
AGE17	-0.10420	-0.15555	0.18944	-0.10099	-0.49886
AGE19	-0.12096*	-0.04964	-0.18480+	-0.19270*	-0.02355
AGE20	-0.01454	-0.03374	-0.13963	0.02261	0.09505
AGE21	0.22439**	0.08272	0.27209**	0.30030**	0.16492+
BLACK	0.11298	-0.40059+	0.31494	0.22500	0.19054
COLL1	-0.34638*	-0.27521	-0.35209	-0.34966	-0.36503
COLL2	-0.12681	-0.15762	-0.37011	0.33880	-0.30100
COLL34	-0.48527*	-0.09849	-1.04996*	-0.34350	-0.27272
COLLGRAD	-0.03643	-0.29158	-0.26207	0.48146	-0.15822
AFQTP	-0.00798**	0.00130	-0.00710+	-0.01025**	-0.01578**
ORLANDO	0.07558*	0.23818**	-0.02804	0.00120	0.15026*
GTLAKES	-0.11713*	-0.08484	-0.07998	-0.06192	-0.23189+
DPMS	-0.05493**	-0.07428**	-0.04847**	-0.03478**	-0.07749**
BODYMASS	-0.17532+	0.00293	-0.07797	-0.40446*	-0.18369
BODYMAS2	0.00370+	0.00001	0.00189	0.00831*	0.00376
BTRATE	-2.88440	7.14292	-0.45979	-13.06817*	-5.94072
MEAN RATE	0.015	0.013	0.015	0.014	0.016
SAMPLE SIZE	99055	23374	27649	29294	18738

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.12

LOGISTIC REGRESSION RESULTS FOR ONE-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY NAVY MEN BY COHORT

Variable	Accession Cohort			
	FY82-FY84	FY82	FY83	FY84
INTERCEP	-4.17157	-4.18913	-7.86042	-0.82971*
COHORT83	-0.01079			
COHORT84	0.22340**			
AGE17	0.34002**	0.36746*	0.22119	0.39220*
AGE19	-0.05541	-0.04182	-0.13485	-0.00107
AGE20	-0.04035	0.02978	-0.12632	-0.01755
AGE21	0.02510	0.01219	0.12813+	-0.04783
BLACK	-0.18278+	-0.29862+	-0.24013	-0.05616
COLL1	-0.27084*	-0.23089	-0.33973	-0.24335
COLL2	-0.44227**	-0.57295*	-0.41868+	-0.36892+
COLL34	-0.23613	0.04689	-0.36405	-0.33152
COLLGRAD	-0.06247	0.07350	-0.13792	-0.07633
AFQTP	-0.00143	-0.00081	-0.00071	-0.00254
ORLANDO	0.02313	0.05781	0.01527	-0.02707
GTLAKES	-0.01747	-0.01963	-0.06196	0.05892
DPMS	-0.06407**	-0.07351**	-0.04657**	-0.06690**
BODYMASS	0.11940	0.11712	0.40373*	-0.11102
BODYMASS2	-0.00322+	-0.00311	-0.00896**	0.00139
BTRATE	-4.44524*	-4.23149	-2.34363	-9.09364*
MEAN RATE	0.022	0.022	0.020	0.023
SAMPLE SIZE	85180	24646	29351	31183

+Significant at the  $\alpha = 0.10$  confidence level.\*Significant at the  $\alpha = 0.05$  confidence level.\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.13

LOGISTIC REGRESSION RESULTS FOR TWO-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY NAVY MEN BY COHORT

Variable	Accession Cohort		
	FY82-FY83	FY82	FY83
INTERCEP	-1.95578*	-0.52583**	-3.35765
COHORT83	0.01321		
AGE17	0.24468**	0.35164**	0.11957
AGE19	-0.04694	-0.02357	-0.07230
AGE20	0.00779	0.03571	-0.02068
AGE21	-0.01259	-0.07388+	0.03360
ELACK	-0.07760	-0.12338	-0.04171
COLL1	-0.16366+	-0.11378	-0.20481+
COLL2	-0.39845**	-0.43013**	-0.37371**
COLL34	-0.12445	-0.02983	-0.20959
COLLGRAD	-0.32830**	-0.05575	-0.52859**
AFQTP	-0.00355**	-0.00255	-0.00457**
ORLANDO	0.01003	0.05879*	-0.02399
GTLAKES	0.03219	0.00242	0.09264
DPMS	-0.06428**	-0.07671**	-0.05589**
BODYMASS	0.02761	-0.10475	0.14554+
BODYMAS2	-0.00108	0.00172	-0.00360*
BTRATE	-1.25955	0.54196	-0.31841
MEAN RATE	0.073	0.076	0.071
SAMPLE SIZE	53997	24646	29351

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.



Table B.14

LOGISTIC REGRESSION RESULTS FOR BASIC TRAINING  
ATTRITION OF HIGH-QUALITY NAVY WOMEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	3.62453**	-4.12707	5.08940*	0.73288	11.85942**
COHORT83	0.03296				
COHORT84	0.01648				
COHORT85	0.15251+				
AGE17	0.04001	-0.15730	-0.41610	0.21739	0.97010*
AGE19	-0.12729*	-0.15279	-0.15640	-0.11088	-0.09773
AGE20	-0.12187+	-0.20359	0.01769	-0.02024	-0.28208*
AGE21	0.14365**	0.15451*	0.22340**	0.05684	0.11175
BLACK	-0.09818	-0.01857	-0.14604	0.05301	-0.21771
COLL1	-0.06508	-0.03627	-0.01508	-0.36153	0.15236
COLL2	-0.25646*	-0.45287+	-0.11456	-0.30327	-0.20591
COLL34	-0.35060+	-0.40184	-0.10237	-0.86335*	-0.09962
COLLGRAD	-0.07236	-0.04671	-0.18825	-0.57945*	0.54620+
AFQTP	-0.01042**	-0.01006*	-0.01477**	-0.00724+	-0.00880*
DPMS	-0.03361**	-0.05884**	-0.01787	-0.03503*	-0.03375*
BODYMASS	-0.36190*	0.19732	-0.44628	-0.14597	-0.97197*
BODYMAS2	0.00629+	-0.00361	0.00774	0.00207	0.01745*
MEAN RATE	0.082	0.080	0.081	0.079	0.090
SAMPLE SIZE	16933	4094	4727	4298	3814

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.15

LOGISTIC REGRESSION RESULTS FOR TECHNICAL TRAINING  
ATTRITION OF HIGH-QUALITY NAVY WOMEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	-2.52590	-11.21995	-7.96324	7.27267	4.39318
COHORT83	0.12005				
COHORT84	-0.01658				
COHORT85	0.36429*				
AGE17	-0.50192	-1.09501	-0.67338	1.07026	-1.14575
AGE19	-0.11855	0.00004	0.01185	-0.30622	-0.15816
AGE20	0.13689	0.03855	0.24380	0.20915	0.03796
AGE21	0.03604	0.17262	-0.09391	0.05435	0.05589
BLACK	-0.29463	-0.60496	0.63476	-0.43270	-0.74260*
COLL1	-0.00628	-0.54035	-0.34268	-0.09947	0.85127+
COLL2	-0.12817	-0.28818	0.16875	-0.74165	0.15261
COLL34	-0.46562	-1.30009	-0.64392	0.67141	-0.32538
COLLGRAD	-0.72407*	-0.87364	-1.21245+	0.15292	-0.94852
AFQTP	-0.00067	0.00217	0.01452+	-0.02287*	0.00011
DPMS	-0.03338*	-0.03612	-0.02810	-0.03013	-0.03260
BODYMASS	-0.05965	0.52211	0.21319	-0.69772	-0.49677
BODYMAS2	0.00044	-0.01007	-0.00406	0.01300	0.00728
BTRATE	-0.91580	6.36702	2.31026	-6.28243	0.48813
MEAN RATE	0.017	0.016	0.017	0.015	0.021
SAMPLE SIZE	15540	3767	4343	3960	3470

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level

Table B.16

LOGISTIC REGRESSION RESULTS FOR ONE-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY NAVY WOMEN BY COHORT

Variable	Accession Cohort			
	FY82-FY84	FY82	FY83	FY84
INTERCEP	-6.79492	-8.35075	-6.63488	-3.14522
COHORT83	0.33141**			
COHORT84	0.18587			
AGE17	0.74202*	0.11223	0.34007	2.03718**
AGE19	-0.04087	0.02661	-0.08051	-0.02999
AGE20	0.15474	0.10736	0.03597	0.37727
AGE21	-0.06520	-0.05805	0.13850	-0.34812**
BLACK	-0.55132**	-0.19027	-0.60953*	-0.69358*
COLL1	0.03818	0.08513	-0.23339	0.36260
COLL2	-0.24336	0.03883	-0.61369+	0.03562
COLL34	-0.16590	-0.26330	-0.11251	-0.20100
COLLGRAD	-0.20728	-0.74464	-0.60764	0.65278
AFQTP	-0.00484	0.00183	-0.00936	-0.00341
DPMS	-0.02926*	-0.02977	-0.02221	-0.03607
BODYMASS	0.31266	0.39844	0.38171	0.01333
BODYMAS2	-0.00643	-0.00799	-0.00771	-0.00086
BTRATE	-0.66500	-2.09556	-5.86372	3.76934
MEAN RATE	0.029	0.025	0.033	0.029
SAMPLE SIZE	13119	4094	4727	4298

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.17

LOGISTIC REGRESSION RESULTS FOR TWO-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY NAVY WOMEN BY COHORT

Variable	Accession Cohort		
	FY82-FY83	FY82	FY83
INTERCEP	-6.52388	-6.78766	-6.26351
COHORT83	0.13310+		
AGE17	0.16315	0.06910	0.28513
AGE19	0.06968	0.16043	-0.00770
AGE20	0.05526	0.18388	-0.05430
AGE21	0.00073	-0.10550	0.07748
BLACK	-0.54010**	-0.56013**	-0.52328**
COLL1	-0.28637+	-0.30655	-0.28386
COLL2	-0.34117*	-0.15379	-0.48242*
COLL34	-0.12028	0.09446	-0.31296
COLLGRAD	-0.63532**	-0.59982*	-0.66374*
AFQTP	-0.00491+	-0.00378	-0.00581
DPMS	-0.04784**	-0.07001**	-0.03558**
BODYMASS	0.38359+	0.35881	0.39249
BODYMAS2	-0.00738+	-0.00688	-0.00756+
BTRATE	-0.25159	6.61561	-2.93848
MEAN RATE	0.098	0.094	0.102
SAMPLE SIZE	8821	4094	4727

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.18

LOGISTIC REGRESSION RESULTS FOR BASIC TRAINING ATTRITION  
OF HIGH-QUALITY AIR FORCE MEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	1.26347**	1.10946**	0.94757**	2.62873**	0.07207*
COHORT83	-0.14805**				
COHORT84	0.15079**				
COHORT85	0.17421**				
AGE17	0.13347+	0.28525*	0.08229	0.08473	-0.00213
AGE19	-0.04389+	-0.05435	-0.05380	-0.07176	0.00367
AGE20	-0.03524	-0.05171	0.02441	-0.11642*	0.01975
AGE21	0.07423**	0.12814**	0.04964	0.07146+	0.05468
BLACK	-0.39647**	-0.39211**	-0.44513**	-0.43206**	-0.33139**
COLL1	-0.19066**	-0.08967	-0.09496	-0.24241**	-0.27366**
COLL2	-0.33936**	-0.24075+	-0.23009+	-0.44732**	-0.35274**
COLL34	-0.41932**	-0.59168*	-0.05227	-0.52487**	-0.45694*
COLLGRAD	0.50797**	1.67540**	0.35222+	0.05593	0.58349**
AFQTP	-0.00862**	-0.00809**	-0.00962**	-0.00916**	-0.00640**
OCC0	0.49141**	0.59459**	0.47123**	0.61476**	0.32759**
OCC1	-0.14488**	-0.17548**	-0.11748	-0.25014*	-0.19772
OCC2	0.06756	0.31646**	-0.02072	-0.09407	0.06615
OCC3	-0.07844	0.22673	-0.17463	-0.03463	-0.21771
OCC4	-0.02517	-0.01733	0.00807	-0.06577	-0.04228
OCC5	-0.20384**	-0.17787	-0.06052	-0.29157**	-0.21785*
OCC6	-0.07736*	-0.01077	-0.04128	-0.16242*	-0.10942
OCC7	-0.20078*	0.02509	0.00857	-0.44113*	-0.17071
OCC8	0.10342	0.19278	0.10959	0.20286	-0.08877
DPMS	-0.02209**	-0.01007	-0.02312*	-0.02836**	-0.03204**
BODYMASS	-0.30733**	-0.30469*	-0.29949+	-0.41256**	-0.19270
BODYMAS2	0.00682**	0.00668*	0.00684+	0.00917**	0.00418
MEAN RATE	0.052	0.051	0.043	0.058	0.059
SAMPLE SIZE	121450	30869	31782	33338	25461

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.19

LOGISTIC REGRESSION RESULTS FOR TECHNICAL TRAINING  
ATTRITION OF HIGH-QUALITY AIR FORCE MEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	-1.17149**	2.24151**	-3.95840	-0.71012	-4.94596
COHORT83	-0.04620				
COHORT84	-0.20711**				
COHORT85	-0.40929**				
AGE17	0.13753	0.52748**	-0.14411	0.14135	-0.44350
AGE19	0.06281+	0.07945	0.06844	-0.00234	0.11114
AGE20	-0.07299+	-0.10406	-0.13936+	-0.02029	0.01044
AGE21	-0.05110	-0.08174	-0.05589	-0.07210	0.02665
BLACK	-0.08046	0.00673	-0.11002	-0.16443	-0.04030
COLL1	-0.25577**	-0.21059	-0.33957*	-0.23611	-0.28656
COLL2	-0.30405**	-0.23365	-0.32762*	-0.22924	-0.55452**
COLL34	-0.14100	0.01529	-0.12712	0.11541	-0.75542*
COLLGRAD	0.42158**	0.47550	0.34386	0.36092	0.57152
AFQTP	-0.01061**	-0.01297**	-0.00887**	-0.01186**	-0.00748*
OCC0	0.33125**	0.36015**	0.03209	0.33642*	0.93685**
OCC1	0.02168	-0.27008	0.44965*	0.92081**	-1.06183*
OCC2	0.22597**	-0.08823	0.21391	0.55674**	0.38144
OCC3	-0.04525	0.31420	-0.16624	-0.26654	0.03596
OCC4	0.13059	0.06201	0.06207	0.13453	0.43605
OCC5	-0.18333*	-0.14248	-0.22893	-0.42803**	-0.14954
OCC6	-0.15476**	-0.08842	-0.04529	-0.13896	-0.42292**
OCC7	-0.15907	0.21881	-0.27326	-0.45197	-0.15693
OCC8	-0.00883	0.27177	-0.21594	-0.41124+	0.22668
DPMS	-0.03624**	-0.04857**	-0.03220**	-0.01999	-0.04703**
BODYMASS	-0.19880+	-0.46656*	-0.00690	-0.17545	-0.05747
BODYMAS2	0.00413+	0.00925*	0.00065	0.00401	0.00063
BTRATE	4.21720	2.95827	11.65263+	-5.25667	31.23704**
TRTIME	0.03775**	0.04808**	0.02558**	0.00530	0.05080**
MEAN RATE	0.025	0.030	0.027	0.024	0.019
SAMPLE SIZE	115089	29305	30415	31420	23949

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.20

LOGISTIC REGRESSION RESULTS FOR ONE-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY AIR FORCE MEN BY COHORT

Variable	Accession Cohort			
	FY82-FY84	FY82	FY83	FY84
INTERCEP	-3.02443	-3.72637	-2.69684	-2.91398
COHORT83	-0.25218**			
COHORT84	-0.29651**			
AGE17	0.07933	0.17039	-0.06697	0.08857
AGE19	0.03756	0.05590	0.00280	0.04768
AGE20	-0.10607+	-0.05079	-0.06582	-0.23076*
AGE21	-0.06771	-0.11582+	-0.01515	-0.07037
BLACK	0.34997**	0.24728+	0.47047**	0.35498*
COLL1	-0.19763*	-0.25451	-0.11154	-0.22669
COLL2	-0.27673**	-0.35183+	-0.36860*	-0.15781
COLL34	-0.29160	-0.20067	-0.50002	-0.20728
COLLGRAD	-0.50377**	-0.82798*	-0.20944	-0.58411*
AFQTP	-0.00145	0.00439	-0.00700*	-0.00276
OCC0	0.76083**	0.40903**	0.99711**	0.93301**
OCC1	-0.32706*	-0.39977*	-0.42972	0.42741
OCC2	0.19199+	0.16570	0.27298	0.12402
OCC3	0.22060	0.64030*	0.55215*	-0.44738+
OCC4	-0.12552	0.03586	-0.17241	-0.28356
OCC5	-0.17147	0.10664	-0.34300*	-0.25355
OCC6	-0.25534**	-0.16064	-0.31403*	-0.23348*
OCC7	-0.54101**	-0.60447	-0.61413+	-0.55946+
OCC8	0.05269	-0.01510	0.04493	0.02874
DPMS	-0.05268**	-0.04771**	-0.05297**	-0.06759**
BODYMASS	0.03163	0.04599	0.02273	0.02569
BODYMAS2	-0.00129	-0.00173	-0.00107	-0.00101
BTRATE	-1.88765	0.96352	-8.55300	0.47191
TRTIME	-0.02128**	-0.01871**	-0.01574+	-0.04136**
MEAN RATE	0.019	0.023	0.019	0.017
SAMPLE SIZE	95989	10869	31782	33338

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.21

LOGISTIC REGRESSION RESULTS FOR TWO-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY AIR FORCE MEN BY COHORT

Variable	Accession Cohort		
	FY82-FY83	FY82	FY83
INTERCEP	-0.78976**	-2.39259	0.76723**
COHORT83	-0.21118**		
AGE17	0.20164*	0.14117	0.30842*
AGE19	0.05448+	0.04805	0.05988
AGE20	-0.01083	-0.00430	-0.02088
AGE21	-0.15475**	-0.14720**	-0.16791**
BLACK	0.41698**	0.40954**	0.42761**
COLL1	-0.23585**	-0.32869**	-0.14955
COLL2	-0.36266**	-0.48160**	-0.26115*
COLL34	-0.43929**	-0.39461+	-0.47460*
COLLGRAD	-0.44954**	-0.65361**	-0.29424
AFQTP	-0.00423**	-0.00227	-0.00653**
OCC0	0.43029**	0.38858**	0.45873**
OCC1	-0.27674**	-0.22688*	-0.36645*
OCC2	0.08154	0.12898	0.04648
OCC3	0.29960**	0.40514*	0.25182+
OCC4	0.05645	0.01460	0.0955 <sup>1</sup>
OCC5	-0.09771	-0.02778	-0.11501
OCC6	-0.14060**	-0.13736*	-0.14220+
OCC7	-0.07377	0.06742	-0.13656
OCC8	0.15570	0.13467	0.20085
DPMS	-0.05127**	-0.06004**	-0.04430**
BODYMASS	-0.06464	0.05905	-0.19956
BODYMAS2	0.00096	-0.00158	0.00372
BTRATE	-3.72874	-2.64269	-5.80237
TRTIME	-0.00720*	-0.00797+	-0.00502
MEAN RATE	0.065	0.070	0.060
SAMPLE SIZE	62651	30869	31782

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.



Table B.22

LOGISTIC REGRESSION RESULTS FOR BASIC TRAINING ATTRITION  
OF HIGH-QUALITY AIR FORCE WOMEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	-1.58556	-3.04441	1.16382	-9.38653	7.17921+
COHORT83	-0.13619+				
COHORT84	0.26282**				
COHORT85	0.28044**				
AGE17	0.37079**	0.56526*	-0.10011	0.54097*	0.28510
AGE19	0.04038	-0.03964	0.09378	0.05482	0.03529
AGE20	-0.00234	0.03114	-0.08256	0.06021	-0.03194
AGE21	-0.07937*	-0.13644	0.05766	-0.05110	-0.16004*
BLACK	-0.48976**	-0.46167**	-0.57796**	-0.37328**	-0.55878**
COLL1	0.01830	0.07708	-0.13079	0.05597	0.04232
COLL2	-0.23107*	-0.22940	-0.24371	-0.33456*	-0.12091
COLL34	-0.21712	0.34366	-0.52357	-0.40543	-0.10479
COLLGRAD	-0.24165+	-0.20363	-0.55362+	-0.35781	0.08361
AFQTP	-0.00421*	-0.00473	-0.00132	-0.00487	-0.00462
OCC0	0.64622	-1.18199	-1.00608	1.91485	0.95510*
OCC1	-0.01199	0.29918+	-0.23144	-0.20692	-0.38774
OCC2	-0.00017	0.02443	0.00550	-0.02714	-0.06833
OCC3	0.10069	0.00743	0.07082	0.01616	0.25787
OCC4	0.13863	0.09133	0.37816	0.45407	-0.30782
OCC5	-0.05490	0.05783	-0.08901	-0.04105	-0.09610
OCC6	0.05305	-0.08116	0.06067	0.07249	0.15786
OCC7	0.23085	-0.04665	0.84603	-0.44465	0.24352
OCC8	-0.10385	0.06831	0.09697	-0.45804+	-0.03319
DPMS	-0.00655	-0.04157*	0.04301*	-0.00350	-0.01260
BODYMASS	-0.03117	0.09334	-0.28243	0.56952	-0.64939
BODYMAS2	0.00038	-0.00199	0.00518	-0.01069	0.01138
MEAN RATE	0.080	0.074	0.062	0.091	0.092
SAMPLE SIZE	22750	4967	5893	6348	5542

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.23

LOGISTIC REGRESSION RESULTS FOR TECHNICAL TRAINING  
ATTRITION OF HIGH-QUALITY AIR FORCE WOMEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	4.37620+	4.44473	-5.50790	4.05751	18.60717*
COHORT83	-0.32875*				
COHORT84	-0.04731				
COHORT85	-0.25293+				
AGE17	0.27979	0.40570	0.02408	0.55799	-0.04552
AGE19	0.06091	0.01399	-0.10190	0.18814	0.15566
AGE20	-0.08400	-0.16023	0.02764	-0.27790	0.12812
AGE21	-0.05870	-0.02475	0.01666	-0.07008	-0.19392
BLACK	-0.49384**	-0.14116	-0.71619**	-0.69909**	-0.34891
COLL1	-0.12542	-0.21370	-0.24609	0.11538	-0.27427
COLL2	0.07804	0.12253	-0.28900	0.55292+	-0.13466
COLL34	-0.33100	-0.53762	-0.61810	-0.19655	-0.01049
COLLGRAD	0.05011	-0.22713	-0.36205	0.13389	0.70817
AFQTP	-0.00772*	-0.01162+	-0.00556	-0.00463	-0.00811
OCC0	3.14812**	3.12830*	-0.59832	4.95621*	3.86649**
OCC1	-0.71232*	-0.74272+	-2.07976*	0.14545	0.53134
OCC2	0.53797**	0.38912	0.44926	0.74863*	0.49666
OCC3	0.02987	-0.21067	0.52501	-0.06855	-0.19653
OCC4	0.31099	-0.06545	0.69445	-0.16668	1.15461+
OCC5	0.00844	0.02137	0.05814	-0.00577	-0.07734
OCC6	0.34689*	0.77374**	1.24437**	-0.34880	-0.55589+
OCC7	0.01720	-0.30713	-0.83529	-0.74662	2.42819*
OCC8	0.01426	-0.21677	-0.23605	0.45918	-0.02127
DPMS	-0.03018*	-0.01949	0.01287	-0.05717*	-0.05707+
BODYMASS	-0.59822+	-0.61027	0.09033	-0.55573	-1.94773*
BODYMAS2	0.01108+	0.01157	-0.00236	0.01008	0.03700*
BTRATE	-3.22544	2.68077	-0.23944	-7.56115+	27.49841
TRTIME	0.06482**	0.04692**	0.09052**	0.06777*	0.06634*
MEAN RATE	0.028	0.036	0.025	0.028	0.024
SAMPLE SIZE	20931	4601	5526	5771	5033

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.24

LOGISTIC REGRESSION RESULTS FOR ONE-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY AIR FORCE WOMEN BY COHORT

Variable	Accession Cohort			
	FY82-FY84	FY82	FY83	FY84
INTERCEP	-7.98404	-12.49684	-9.35686	-1.37736
COHORT83	-0.08037			
COHORT84	-0.20836+			
AGE17	0.40166+	-0.36642	0.42549	1.18527**
AGE19	0.02323	0.05973	-0.09614	0.11557
AGE20	-0.16356	-0.21557	-0.06386	-0.23911
AGE21	-0.00104	0.20493+	-0.00702	-0.16215
BLACK	-0.38203**	-0.35426	-0.41034*	-0.35243+
COLL1	-0.29590+	-0.62986*	-0.16314	-0.16923
COLL2	-0.13079	-0.39699	-0.02296	-0.02793
COLL34	-0.22687	-0.49418	0.01884	-0.26098
COLLGRAD	-0.08171	0.28015	-0.23539	-0.09981
AFQTP	-0.00588+	-0.00751	-0.00388	-0.00592
OCC0	0.79034	2.89376*	-1.01873	-1.26882
OCC1	0.20896	0.12520	-0.38171	0.65661
OCC2	0.04853	0.05849	-0.13560	0.35732
OCC3	-0.10107	-0.11242	-0.36625	0.18649
OCC4	-0.42870	-0.53948	-0.27497	-0.49492
OCC5	-0.20703+	0.01800	-0.11344	-0.34544+
OCC6	0.17662	0.14433	0.25507	0.09523
OCC7	-0.74821	-0.75446	-0.62546	-1.18885
OCC8	0.26307	0.61308	-0.07232	0.57495
DPMS	-0.04897**	-0.01564	-0.07011**	-0.06311**
BODYMASS	0.45677	0.80466	0.53373	-0.02080
BODYMASS2	-0.00848	-0.01516	-0.00931	-0.00012
BTRATE	-0.87518	-1.85030	-9.86286	1.29507
TRTIME	-0.03654**	-0.03250*	-0.02329	-0.05093+
MEAN RATE	0.035	0.037	0.037	0.031
SAMPLE SIZE	17208	4967	5893	6748

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.25

LOGISTIC REGRESSION RESULTS FOR TWO-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY AIR FORCE WOMEN BY COHORT

Variable	Accession Cohort		
	FY82-FY83	FY82	FY83
INTERCEP	-4.20552	-2.09388	-5.56809
COHORT83	0.03915		
AGE17	-0.01636	-0.45956*	0.39402+
AGE19	0.02869	0.02143	0.02957
AGE20	-0.06188	-0.21203+	0.05339
AGE21	0.03263	0.16633*	-0.06316
BLACK	-0.45925**	-0.4653 **	-0.44843**
COLL1	-0.16951	-0.33525+	-0.05425
COLL2	-0.07980	-0.25447	0.03635
COLL34	-0.17410	-0.52447	0.07153
COLLGRAD	-0.23246	-0.11671	-0.26037
AFQTP	-0.00747**	-0.00906*	-0.00620+
OCC0	0.23240	1.14398	-1.10557
OCC1	0.22866	0.22532	0.02146
OCC2	-0.00540	-0.07304	0.04056
OCC3	-0.23899+	-0.18168	-0.24433
OCC4	-0.04344	-0.14093	0.04543
OCC5	-0.04482	0.15696	-0.07741
OCC6	-0.01811	0.03933	-0.11105
OCC7	-0.83877**	-0.84138*	-0.86887*
OCC8	0.12453	-0.03463	0.22362
DPMS	-0.04312**	-0.04424**	-0.04419**
BODYMASS	0.24148	0.13877	0.29640
BODYMAS2	-0.00425	-0.00306	-0.00477
BTRATE	-3.25037	-4.28422	-1.72919
TRTIME	-0.02248**	-0.02225*	-0.01740
MEAN RATE	0.106	0.099	0.112
SAMPLE SIZE	10860	4967	5893

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.26

LOGISTIC REGRESSION RESULTS FOR BASIC TRAINING ATTRITION  
OF HIGH-QUALITY MARINE CORPS MEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	7.34668**	6.65714**	6.37513**	7.03300**	10.35851**
COHORT83	0.00909				
COHORT84	-0.04488				
COHORT85	-0.09654*				
AGE17	-0.14102**	-0.19173*	0.02310	-0.24537*	-0.16864
AGE19	-0.01317	-0.01148	-0.06598	0.04332	-0.02215
AGE20	0.06792	0.19845*	-0.06313	0.03804	0.13894
AGE21	0.47102**	0.62906**	0.41445**	0.41525**	0.44378**
BLACK	-0.08836+	0.10704	-0.10386	-0.03667	-0.43653**
COLL1	-0.39562**	-0.22335	-0.40041**	-0.57245**	-0.26667
COLL2	-0.57853**	-0.45259*	-0.39950*	-0.67346**	-0.84376**
COLL34	-0.41024**	-0.61107+	-0.11062	-0.76495**	0.04526
COLLGRAD	-0.38446**	-0.44070	-0.30336+	-0.07886	-0.62045*
AFQTP	-0.00680**	-0.00590**	-0.00715**	-0.00729**	-0.00661**
PARRIS 'IS	-0.02652+	-0.27952**	0.03415	-0.02122	0.22151**
DPMS	-0.03629**	-0.04005**	-0.02412**	-0.04012**	-0.04078**
BODYMASS	-0.79913**	-0.75528**	-0.72176**	-0.77316**	-1.04676**
BODYMAS2	0.01770**	0.01688**	0.01617**	0.01720**	0.02255**
MEAN RATE	0.104	0.109	0.106	0.100	0.100
SAMPLE SIZE	56507	13663	15267	17029	10548

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.27

LOGISTIC REGRESSION RESULTS FOR TECHNICAL TRAINING  
ATTRITION OF HIGH-QUALITY MARINE CORPS MEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	9.02844**	12.44218**	8.55060**	8.69253**	5.79351**
COHORT83	-0.01838				
COHORT84	0.12853				
COHORT85	0.04933				
AGE17	-0.08604	-0.06234	-0.12711	-0.15788	0.00610
AGE19	0.01646	-0.00594	0.01036	0.05029	0.02390
AGE20	-0.18150*	-0.27846	-0.27964	-0.18713	0.04607
AGE21	0.32504**	0.53838**	0.18606	0.44185**	0.10907
BLACK	-0.16620	-0.42132+	-0.07294	-0.06035	-0.13962
COLL1	-0.34196*	-0.32206	-0.09332	-0.14349	-0.93217**
COLL2	-0.11388	-0.36063	0.13642	-0.00404	-0.29117
COLL34	-0.53092	-0.24047	-0.89980	-0.50161	-0.59224
COLLGRAD	-0.37506	-0.53736	0.76620	-0.85221	-0.70118
AFQTP	-0.00003	-0.00780+	0.00037	0.00332	0.00437
PARRIS IS	0.18949**	0.03230	0.03131	0.37583**	0.17595
DPMS	-0.05272**	-0.04715*	-0.04724*	-0.04245**	-0.09207**
BODYMASS	-1.19616**	-1.42272**	-1.20360**	-1.19323**	-0.89980**
BODYMAS2	0.02713**	0.03198**	0.02732**	0.02731**	0.02051**
BTRATE	2.17096*	-0.53932	7.50795*	1.30632	1.48144
MEAN RATE	0.023	0.023	0.021	0.023	0.023
SAMPLE SIZE	50634	12172	13646	15322	9494

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.28

LOGISTIC REGRESSION RESULTS FOR ONE-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY MARINE CORPS MEN BY COHORT

Variable	Accession Cohort			
	FY82-FY84	FY82	FY83	FY84
INTERCEP	-3.14635	-0.82883	-3.95470	-3.21379
COHORT83	0.13156			
COHORT84	0.18470*			
AGE17	0.13623	0.33037+	0.12950	-0.11731
AGE19	0.01257	0.14846	0.00568	-0.03969
AGE20	0.02028	-0.03261	-0.05729	0.14972
AGE21	0.08373	0.23104	-0.06750	0.15078
BLACK	-0.04471	-0.07490	0.12741	-0.17773
COLL1	-0.56031**	-0.60088+	-0.57547+	-0.51734+
COLL2	-0.27275	-0.05281	-0.27791	-0.39322
COLL34	0.07647	0.18349	0.86204	-0.62669
COLLGRAD	0.47011	0.57933	1.43724*	-0.23274
AFQTP	-0.00771**	-0.00406	-0.01027*	-0.00738+
PARRIS IS	-0.04420	-0.02837	-0.11136+	0.05416
DPMS	-0.07054**	-0.07345**	-0.08763**	-0.05775**
BODYMASS	0.06530	-0.14599	0.15600	0.11079
BODYMAS2	-0.00196	0.00200	-0.00382	-0.00270
BTRATE	-3.74679**	-2.45892	-2.99941	-9.37197**
MEAN RATE	0.022	0.019	0.023	0.023
SAMPLE SIZE	45959	13663	15267	17029

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.29

LOGISTIC REGRESSION RESULTS FOR TWO-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY MARINE CORPS MEN BY COHORT

Variable	Accession Cohort		
	FY82-FY83	FY82	FY83
INTERCEP	-0.50022**	0.71268**	-1.57284
COHORT83	-0.01216		
AGE17	0.25675**	0.37534**	0.08458
AGE19	0.00560	0.10052	-0.06431
AGE20	-0.02420	0.01850	-0.05355
AGE21	-0.01652	0.02802	-0.04061
BLACK	0.20026*	0.11969	0.27279*
COLL1	-0.39606**	-0.40354*	-0.39917*
COLL2	-0.31545*	-0.27332	-0.35166+
COLL34	0.03189	0.05825	-0.01133
COLLGRAD	0.38248	0.19483	0.50975
AFQTP	-0.00704**	-0.00665**	-0.00738**
PARRIS IS	-0.04242+	-0.02676	-0.04004
DPMS	-0.07678**	-0.06926**	-0.08126**
BODYMASS	-0.08646	-0.18950	0.00908
BODYMAS2	0.00174	0.00373	-0.00013
BTRATE	-2.15888**	-1.85372+	-3.30246+
MEAN RATE	0.070	0.071	0.069
SAMPLE SIZE	28930	13663	15267

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.



Table B.30

LOGISTIC REGRESSION RESULTS FOR BASIC TRAINING ATTRITION  
OF HIGH-QUALITY MARINE CORPS WOMEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	-0.24377	0.61681	-4.60632	8.85155+	-9.52088
COHORT83	0.12897				
COHORT84	0.22888*				
COHORT85	0.15277				
AGE17	0.17167	0.38109	0.23479	0.13626	-0.05090
AGE19	-0.01677	0.02339	0.24612	-0.15846	-0.14782
AGE20	-0.13124	-0.20861	-0.17370	-0.19208	-0.02366
AGE21	0.06499	-0.12396	0.01886	0.04924	0.29310*
BLACK	-0.29417**	-0.52050*	-0.30033	-0.11732	-0.31142+
COLL1	-0.03243	0.54282+	-0.00270	0.07828	-0.60071*
COLL2	-0.41688*	-0.24714	-0.26156	-0.49763	-0.76375*
COLL34	-0.55790+	-0.60221	0.27134	-0.54924	-1.03738+
COLLGRAD	-0.43662+	-0.45697	-0.68580	-0.21657	-0.55318
AFQTP	-0.01031**	-0.00949+	-0.01090+	-0.00897+	-0.01051+
PARRIS' IS	-0.00128	0.01076	-0.01833	-0.00337	-0.00793
DPMS	-0.06165**	-0.07748**	-0.05440*	-0.07222**	-0.04134
BODYMASS	-0.09853	-0.16937	0.19707	-0.76560	0.64493
BODYMAS2	0.00262	0.00400	-0.00218	0.01492	-0.01178
MEAN RATE	0.138	0.125	0.129	0.150	0.150
SAMPLE SIZE	6525	1687	1639	1729	1470

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.31

LOGISTIC REGRESSION RESULTS FOR TECHNICAL TRAINING  
ATTRITION OF HIGH-QUALITY MARINE CORPS WOMEN BY COHORT

Variable	Accession Cohort				
	FY82-FY85	FY82	FY83	FY84	FY85
INTERCEP	8.71698+	2.17312	19.75188+	0.25195	28.71197
COHORT83	0.06079				
COHORT84	-0.40354*				
COHORT85	-0.61881**				
AGE17	0.03229	0.71579	-0.29099	-0.52312	-0.13886
AGE19	-0.15787	-0.06323	-0.65497*	0.41866	-0.29695
AGE20	-0.20787	-0.32730	0.14532	0.06962	-0.82744+
AGE21	0.16660	-0.00191	0.40243	-0.17104	0.55041
BLACK	-0.26212	-0.00230	-1.14363**	0.09026	0.11947
COLL1	-0.32118	-0.15689	-0.30784	-0.89000	-0.10130
COLL2	-0.26652	-0.08261	-0.65472	0.44830	-0.80140
COLL34	-0.45974	-0.01505	-1.19421	0.47847	-1.69159
COLLGRAD	-0.59307	-1.09921	0.01113	-0.95749	-0.33303
AFQTP	-0.01742**	-0.01587	-0.03029**	-0.00341	-0.01835
PARRIS IS	0.00299	0.00796	0.01503	-0.02022	0.01038
DPMS	-0.04361+	-0.04788	-0.01498	-0.05914	-0.06255
BODYMASS	-0.83838	-0.38163	-1.55629	-0.27763	-2.54476
BODYMAS2	0.01620	0.00857	0.02896	0.00394	0.05020+
BTRATE	2.18204	-0.93700	0.74843	8.66568*	3.40408
MEAN RATE	0.034	0.042	0.041	0.029	0.024
SAMPLE SIZE	5622	1476	1427	1470	1249

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.32

LOGISTIC REGRESSION RESULTS FOR ONE-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY MARINE CORPS WOMEN BY COHORT

Variable	Accession Cohort			
	FY82-FY84	FY82	FY83	FY84
INTERCEP	-1.20821	4.07296	-4.98456	-6.45920
COHORT83	-0.18737			
COHORT84	0.07722			
AGE17	-0.01977	-0.13610	0.29208	-0.07317
AGE19	0.02637	-0.09512	-0.10000	0.20620
AGE20	0.00667	0.06083	-0.26205	0.15547
AGE21	0.26218+	0.43572+	0.27058	0.07923
BLACK	-0.46995*	-0.72936*	-0.80902*	0.00478
COLL1	-0.25046	0.17699	-0.03065	-0.71645
COLL2	-0.31351	-0.90890	0.44236	-0.40275
COLL34	-0.91636	-1.24911	-1.08327	-0.40857
COLLGRAD	-0.84095+	-1.36355	-0.42217	-0.74783
AFQTP	-0.00753	-0.01293	-0.00628	-0.00364
PARRIS IS	-0.00379	-0.01234	0.01298	-0.00893
DPMS	-0.02081	-0.03600	-0.01159	-0.01552
BODYMASS	0.00665	-0.32921	0.28272	0.34784
BODYMAS2	-0.00153	0.00387	-0.00709	-0.00688
BTRATE	-1.46604	0.63240	-1.12068	-3.75948
MEAN RATE	0.043	0.044	0.037	0.046
SAMPLE SIZE	5055	1687	1639	1729

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

Table B.33

LOGISTIC REGRESSION RESULTS FOR TWO-YEAR POST-TRAINING  
ATTRITION OF HIGH-QUALITY MARINE CORPS WOMEN BY COHORT

Variable	Accession Cohort		
	FY82-FY83	FY82	FY83
INTERCEP	7.98124*	11.55850*	-0.56991
COHORT83	-0.18858+		
AGE17	0.03532	-0.20850	0.39099
AGE19	-0.10108	-0.14289	-0.03314
AGE20	-0.01309	0.07989	-0.15687
AGE21	0.21208*	0.26732*	0.17123
BLACK	-0.65209**	-0.61219**	-0.69870**
COLL1	-0.06224	0.05949	-0.19892
COLL2	-0.45131*	-0.80140**	-0.01720
COLL34	-0.85654*	-0.89170	-0.83953
COLLGRAD	-0.47603	-0.67198	-0.33025
AFQTP	-0.00408	-0.00961+	0.00334
PARRIS IS	0.00048	-0.00437	0.00953
DPMS	-0.01860	-0.00224	-0.03248
BODYMASS	-0.64262+	-0.91001*	-0.02093
BODYMAS2	0.01156+	0.01687*	-0.00051
BTRATE	-1.47978+	-1.05541	-1.61830
MEAN RATE	0.163	0.176	0.149
SAMPLE SIZE	3326	1687	1639

+Significant at the  $\alpha = 0.10$  confidence level.

\*Significant at the  $\alpha = 0.05$  confidence level.

\*\*Significant at the  $\alpha = 0.01$  confidence level.

## Appendix C

### REASONS FOR BASIC TRAINING ATTRITION

Table C.1

SERVICE DIFFERENCES IN REASONS FOR BASIC TRAINING ATTRITION  
(High-quality recruits, FY82-FY85)

Primary Reason	Army	Navy	Air Force	Marines
<b>Male Recruits</b>				
<i>Medical Disqualification</i>				
Condition existing prior to service	2	2	0	14
Unqualified for active duty - other	35	4	34	1
<i>Failure To Meet Minimum Behavior/Performance</i>				
Character/behavior disorder	1	7	0	0
Drugs	0	5	0	0
Fraudulent entry	1	12	3	27
Trainee discharge	57	26	47	44
<i>Other Separations</i>				
Erroneous enlistment	0	38	9	12
<i>All Other Reasons</i>	4	6	7	2
<b>Female Recruits</b>				
<i>Medical Disqualifications</i>				
Condition existing prior to service	1	6	0	6
Unqualified for active duty - other	29	8	36	1
<i>Failure To Meet Minimum Behavior/Performance</i>				
Character/behavior disorder	1	8	0	0
Drugs	0	0	0	0
Fraudulent entry	0	5	3	14
Trainee discharge	61	38	44	70
<i>Other Separations</i>				
Erroneous enlistment	6	23	5	9
Pregnancy	0	2	9	0
<i>All Other Reasons</i>	2	10	3	0

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